

**The Characteristics, Outcomes and Sources of the  
Learning Organization: The Case of Car  
Component Suppliers in Britain**

Ph. D. Thesis

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“If anything, the need for understanding  
how organizations learn and accelerating that learning  
is greater today than ever before.”  
(Senge 1990a: 7)

Many thanks to

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## ABSTRACT:

This thesis contributes to the understanding of the theory of organizational learning and the Learning Organization, focusing on the characteristics, outcomes and sources of the Learning Organization.

A critical review of existing literature has led to the identification of the ten characteristics of the Learning Organisation. Two main hypothesis were then developed and tested. The first hypothesis, referring to intra-organizational learning, is that the existence of the characteristics of the Learning Organization within a company enhance organizational learning. The second hypothesis, concerning inter-organizational learning, is that these characteristics are mainly acquired through relationships with Japanese car producing and/or component supplying companies.

non-supplier

only?

This thesis examines direct car component suppliers in Britain, using a combination of three empirical methods: exploratory interviews, the analysis of seventy questionnaires and in-depth interviews.

The conclusions and contributions of this research are as follows:

Firstly, an improved working definition of organizational learning is developed. This new definition comprises the most important elements of former definitions, but considerably extends them.

Secondly, a new model of the comprehensive organizational learning cycle is elaborated, consisting of two phases. Furthermore, the cycle is analysed with regard to possible interruptions.

Thirdly, a coherent model of the Learning Organization with its characteristics is synthesised and refined from the piecemeal models of the existing literature, as well as operationalized for empirical research.

Fourthly, this thesis concludes that the Learning Organization's characteristics have a positive impact on organizational learning outcomes, though predominantly in an indirect way via organizational learning systems (first null hypothesis rejected).

Fifthly, this thesis concludes that the relationship of component suppliers in Britain to Japanese companies in the car industry is advantageous when acquiring tacit knowledge about the characteristics of the Learning Organization (second null hypothesis rejected). Nevertheless, the commitment of top management plays a pivotal role in this process.

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## **ABBREVIATIONS:**

bc	- beta coefficient
cf.	- confer
ed.	- edition/editor(s)
ed. by	- edited by
FAZ	- Frankfurter Allgemeine Zeitung
FT	- Financial Times
GATT	- General Agreement on Tariffs and Trade
IMVP	- International Motor Vehicle Program
MITI	- Ministry of International Trade and Industry
n	- number of valid cases
No.	- number
N. A. A.	- no author available
NAFTA	- North American Free Trade Agreement
NUMMI	- New United Motor Manufacturing, Inc.
rev. ed.	- revised edition
SMMT	- Society of Motor Manufacturers and Traders
SPC	- Statistical Process Control
TPM	- Total Productive Maintenance
TQ	- Total Quality
TQM	- Total Quality Management
QC	- Quality Circle

## 1. INTRODUCTION

### 1. Introduction

As a prologue of this thesis, this chapter first presents the area and the goals of this research, then it introduces the two main hypotheses and the major findings. Finally, it outlines the structure of this thesis.

#### 1.1. Area and Objectives of Research of this Thesis

The interest in the area of research of this thesis started with Argyris & Schön's work about organizational learning<sup>1</sup> in 1978. Later, with the publication of Senge's book (1990) "The Fifth Discipline - The Art & Practice of the Learning Organization", this area attracted new attention. However, Huber (1991: 88 or 1991a: 124), for example, suggests that "there is a lack of both cumulative work and syntheses with which to create a more mature literature". This still appears to be the case, and this thesis aims to rectify this situation.

Additionally, the literature about organizational learning and the Learning Organization<sup>2</sup> is dominated by prescriptive, normative management literature and anecdotal evidence of some case studies (cf., e.g., Stata 1989, Senge 1990, Leonard-Barton 1992, Garvin 1993 and Thurbin 1994, etc.). Despite some empirical work with a larger sample (Shrivastava 1983, Ulrich *et al.* 1993, Inkpen 1992 and Dierkes & Raske 1994 and 1994a), there still appears to be a lack of adequate conceptualization, operationalization (i.e. transforming a theory so that it can be used to research reality) and comprehensive empirical testing of the model of the Learning Organization, particularly as regards its outcomes and origins. The reasons for this scarcity to date might be found in the relative novelty of the empirical interest in this subject of the ideal model of the Learning Organization, combined with the complexity of the

---

<sup>1</sup> Organizational learning is achieved through individual learning of the members of the organization. However, organizational and individual learning are not identical.

<sup>2</sup> The "Learning Organization" is spelled with a capital "L" and "O" in this thesis and the expression refers to the concept of an organization which excels in organizational learning and its outcomes (cf. Chapter 3). This does not deny the fact that every organization can learn by chance, which is the reason why some authors claim that all organizations are "learning organizations".

## 1. INTRODUCTION

operationalization of the theory as well as the need for considerable resources in order to conduct extensive empirical research.

This thesis reports in particular on a theory-led empirical analysis. This involves the identification of the characteristics of the Learning Organization and the analysis of the outcomes of organizational learning in practice, which in turn leads to a refinement of the theory of organizational learning and the Learning Organization. The research was conducted on a broad sample of seventy component supplier companies in the automotive industry in Great Britain, the choice of which is explained below.

In the late 1980s and early 1990s, a lot has been written about the various reasons for the international economic success of the Japanese firm<sup>3</sup>, especially in the automobile industry, e.g., lean production (Womack *et al.* 1990), trust based customer-supplier relations (Sako 1992), innovation (Shimokawa 1994), etc. There are certain easily measurable formal methods and systems, such as, e.g., just-in-time (JIT) production or total quality management (TQM). This thesis suggests that there are essential supporting informal methods, which are hard to identify and measure, because they are mostly qualitative. Oliver & Wilkinson (1992: 18f, 321f), for example, claim that the main reason for a failure to introduce formal methods, like JIT or TQM, is the lack of supporting informal methods in the first place, such as certain work practices, personnel and industrial relation systems.

This thesis focuses on the theory of the Learning Organization and its characteristics, as a possible way of identifying these supporting informal methods. This includes a distinction between the process of their acquisition, as well as how conducive the characteristics are to the implementation of formal systems and to the organizational learning outcomes. The theory about organizational learning and the Learning Organization offers a coherent theoretical framework, which is refined here, in order to look at the car industry from a different angle than previous models. A further reason is that the literature on the Learning Organization and organizational learning states that some Japanese car

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<sup>3</sup> There is no doubt about the fact that Japanese economy in a state of recession in mid 1998. However, this is rather due to a deep rooted crisis in the finance sector as well as the political sector than to a decline of the Japanese manufacturing industry (cf. also Tominaga (WirtschaftsWoche) 25-6-1998).

## 1. INTRODUCTION

companies are Learning Organizations (Senge 1990, Adler & Cole 1993 and Garvin 1993).

It is argued here that the perception of organizations as learning entities helps to understand and identify the amplifiers for, and the impediments against, organizational learning. Enhancing these amplifiers, and removing these impediments, is conducive to organizational learning outcomes and, thereby, to organizational effectiveness and efficiency. The framework of the Learning Organization appears to be a useful tool for analysing, and even improving, existing organizations.

As 50 to 70 per cent of the cost of producing a car can be related to its delivered parts (FT (1) 28-6-1993), this work focuses on car component suppliers. Due to the vast direct investment by Japanese car producers and some of their suppliers in Western Europe, especially in Britain, the situation of British car component supplier has changed dramatically over the recent years. On the one hand, there has been an opportunity to gain new customers and orders (FT (5) 28-6-1993 & FT (9) 28-6-1993). On the other hand, it appears to have been very demanding for British suppliers to fulfil quality standards required by the Japanese car producers and to survive against the new Japanese competition (FT 14-7-1992).

Because of this strong exposure to Japanese companies of direct car component suppliers in Britain, this thesis researches those companies who directly supply to car manufacturers without any intermediary. This thesis investigates the framework of the Learning Organization in the automotive components supplying industry in Britain with the help of exploratory interviews, questionnaires and in-depth interviews.

Andersen Consulting (1994: 5) suggest in their report that the "UK has benefited from foreign investment and the plants supplying Japanese customers appear to be learning from these customers." However, they, as well as Krafcik (1986: 28) in North America, fail to research this learning process in more detail. This thesis fills this gap in current research.

To summarize, this thesis focuses on the theoretical development, operationalization and empirical testing of a model of the Learning Organization, in order to investigate what Learning Organizations look like in reality (**characteristics**), what benefits they have (**outcomes**), as well as where the Learning Organization's characteristics have originated (**sources**).



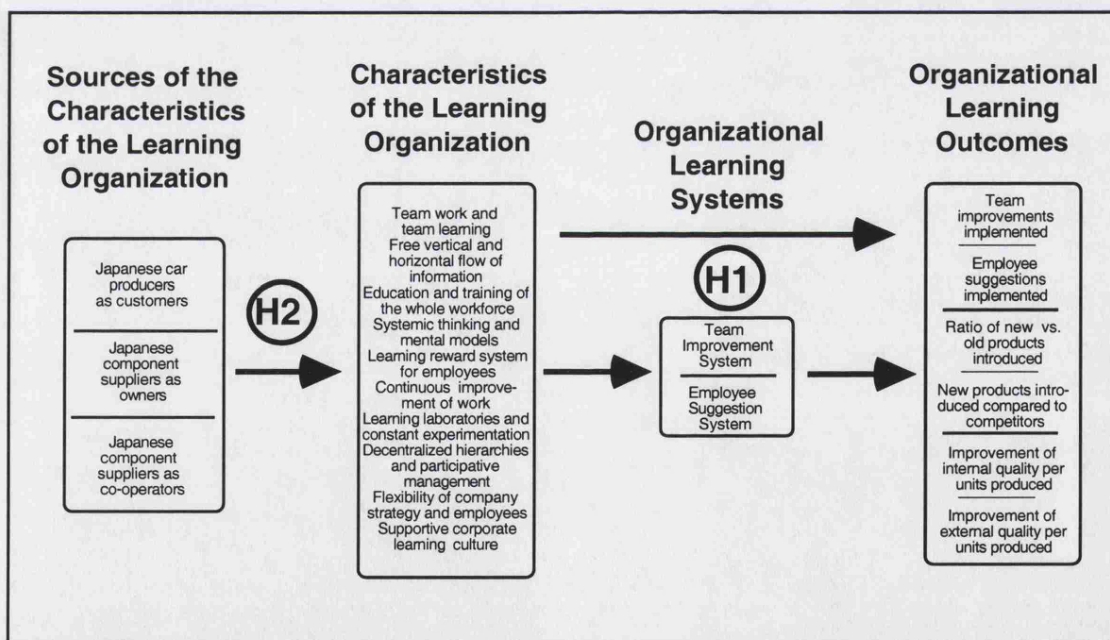
## 1. INTRODUCTION

This thesis concentrates mainly on the evaluation of, and contribution to, the body of literature on organizational learning and the Learning Organization. There are some overlapping areas such as lean production in particular, but also operations management, just-in-time (JIT) management, total quality management (TQM) or innovation theory, which will be covered shortly. Some of the limitations in their explanatory power can still be offset in this thesis by the theory of organizational learning and the Learning Organization, which provides a kind of meta-theory. This is especially the case for the dynamics in the automotive industry, as the discussion at the end of Chapter 4 demonstrates.

### 1.2. Hypotheses and Contributions

This thesis is based on two main hypothesis (depicted in Figure 1.1), which have been developed through a critical review of existing literature.

Figure 1.1: The Two Hypotheses (H1 and H2) of this Thesis



The *first Hypothesis* (H1) relates to intra-organizational learning. it suggests the positive impact of the Learning Organization's characteristics

## 1. INTRODUCTION

of car component suppliers in Britain on their organizational learning outcomes.

The *second Hypothesis* (H2) is on inter-organizational learning. It proposes that the above mentioned characteristics of the Learning Organization are predominantly acquired through some form of relationship with Japanese car producing or component supplying companies.

This thesis takes the philosophical standpoint of the phenomenological paradigm (for detailed discussion see Chapter 6), i.e. the world is socially constructed and subjective, the observer is part of what is observed and that science is driven by human interests. This thesis uses Popper's "critical rationalism" (1959) for empirical null-hypotheses testing, which is about rejecting hypotheses in order to investigate the viability of the theory developed, i.e. the interaction between the Learning Organization's characteristics, its outcomes and sources.

The major contributions of this thesis are set out below.

Firstly, an improved working definition of organizational learning is developed. This new definition comprises the most important elements of former definitions, but considerably extends them.

Secondly, a new model of the comprehensive organizational learning cycle is elaborated. Furthermore, the cycle is analysed with regard to possible interruptions, which block the process of organizational learning. It is also shown that the successfully completed cycle consists of two phases. In the primary comprehensive organizational learning cycle, started by top management, the organization is focused and structured to accomplish certain goals. In the secondary organizational learning cycle, the rest of the organization strives for these goals set by top management.

Thirdly, a coherent model of the Learning Organization with its characteristics is synthesised and refined from the piecemeal models of the existing literature, as well as operationalized for empirical research.

Fourthly, the first main null-hypothesis can be rejected, however, only partially. It is shown that the Learning Organization's characteristics have a positive impact on organizational learning outcomes, though predominantly in an indirect way via organizational learning systems.

## 1. INTRODUCTION

Fifthly, the second main null-hypothesis can be rejected, as well. It is demonstrated that the relationship of component suppliers in Britain to Japanese companies in the car industry is advantageous when acquiring tacit knowledge about the characteristics of the Learning Organization. Nevertheless, the commitment of top management plays a pivotal role in this process, which has been confirmed by the in-depth interviews.

### 1.3. Proceeding Structure

The structure of the succeeding chapters of this thesis is set out below.

There is a focus on theoretical work in the second to fourth chapter of this thesis, which in detail look as follows.

The second chapter introduces and discusses different learning theories and elaborates a *definition of organizational learning* for this thesis. This is followed by a distinction between internal and external organizational learning. Then, the three levels of organizational learning are presented and the factors that initiate, enforce and obstruct organizational learning are introduced. Next, a discussion of organizational memory follows. Finally, after an introduction to different organizational learning cycles, a *model of the comprehensive organizational learning cycle* is constructed at the end of the chapter.

The third chapter develops an improved ideal model of *the Learning Organization*, combining *ten major characteristics*, which are identified in about thirty different pieces of literature. The chapter continues with the explanation of interdependencies among the ten characteristics of the Learning Organization and discussing their ranking in order of importance

The fourth chapter illustrates *the history of Japan from the learning perspective*, as it is seen to be conducive to the development of Learning Organizations in Japan. The focus is then put on the Japanese car industry, from its beginning in 1936, with special emphasis on the post-war period. Then, there is a discussion of flow of Japanese knowledge and know-how to Europe and North America. Finally, theories which overlap with the organizational learning theory are discussed, showing the advantages of the latter.

After the theoretical focus of Chapters 2 to 4 of this thesis, there is a focus on empirical work in Chapters 5 to 9, which in detail look as follows.



## 1. INTRODUCTION

The fifth chapter gives an *overview of the situation of direct component suppliers to the car industry in Britain*, as the empirical research focuses on this area. The unique British situation, compared to the rest of Western Europe, is marked by attracting the lion's share of Japanese automotive direct investments in Western Europe and, therefore, a strong presence of Japanese car assemblers and car component suppliers.

The sixth chapter discusses previous empirical studies on organizational learning and the Learning Organization, and explains the *modelling of the conceptual framework used for the empirical work*. It also explains the reasons for the selection of the *research philosophy and empirical research methods*. A combination of three different methods is elaborated in order to obtain a solid balance of research procedures, which are exploratory interviews, a questionnaire survey and in-depth interviews.

The seventh chapter presents the *result of the exploratory interviews* with six car component suppliers in Britain, in order to examine the general framework of this thesis. The exploratory interviews focus on the measurement of characteristics of the Learning Organization, their outcomes and sources, in order to refine the approach of this research project, including the hypotheses.

The eighth chapter deals with the *result of the questionnaire survey*, which was mailed to direct car component suppliers in Great Britain (part one of the Appendix contains a copy of the questionnaire for the suppliers). With the help of seventy completed questionnaires of direct car component suppliers with production facilities in Great Britain, the two main hypotheses were examined by correlation and regression analysis, and various conclusions were discussed and drawn from these outcomes.

The ninth chapter explores four selected companies with the help of *in-depth interviews*, in order to support the findings and corroborate the interpretations from the questionnaire survey. Furthermore, additional insights are sought into the organizational double-loop learning process of acquiring the characteristics of the Learning Organization.

The tenth and last chapter draws a *conclusion* about the implications and contributions of this thesis, which can be gained from looking at the construction of a theoretical framework (as mainly presented in the Chapters 2, 3 and 4) and its examination by empirical research (as presented in the Chapters 5, 6, 7, 8 and 9). The key findings and insights



## 1. INTRODUCTION

are presented and discussed here: on the literature side of as well as on the management side.

## 2. Organizational Learning

The Chapters 2, 3 and 4 focus on the theoretical part of this thesis. Chapter 2 discusses and defines organizational learning<sup>4</sup> (i.e. the process); Chapter 3 deals with the Learning Organization<sup>5</sup> (i.e. the subject) as an ideal. Chapter 4 looks at the learning history of Japan, specifically its car industry, as a source for the model of the Learning Organization.

This chapter deals with the different elements of organizational learning. It starts with the three main types of learning theories, which are individual, team and organizational learning. The chapter continues with different definitions of organizational learning and also develops a new one.

Furthermore, different levels of organizational learning are introduced, which are single-loop learning (i.e. adjustment learning), double-loop learning (i.e. change learning) and deutero-learning (i.e. learning learning). Then, the initiating, enforcing and obstructing factors of organizational learning are discussed. The subsequent section introduces organizational memory. Finally, organizational learning cycles from various authors are introduced, and a new model of the comprehensive organizational learning cycle is developed.

### 2.1. Different Types of Learning Theories

The Oxford Dictionary (1974: 480) defines the verb “to learn” as “to gain knowledge of or skill in, by practice, study or being taught”.

Although learning of the individual is not identical with learning of organizations, individual learning is the *conditio sine qua non* for organizational learning (cf. Argyris & Schön 1978: 9ff, Hedberg 1981: 6, Klimecki *et al.* 1991: 127 and Kim 1993: 37ff).

Therefore, individual learning, group learning and organizational learning theories are explained in the following sections.

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<sup>4</sup> For the definition of “organizational learning” see end of Chapter 2.1.

<sup>5</sup> For the definition of the “Learning Organization” see end of Chapter 3.2.

## 2. ORGANIZATIONAL LEARNING

### 2.1.1. Individual Learning Theory

The existent definition of learning theories normally apply only to individual learning. According to Pautzke (1989: 90), the best known and most frequently-quoted definition of individual learning stems from Hilgard & Bower (1975: 17), who define individual learning as follows:

“Learning refers to the change in a subject’s behavior to a given situation brought about by his repeated experiences in that situation, provided that the behavior change cannot be explained on the basis of native response tendencies, maturation or temporary states of the subject (e.g. fatigue, drugs, etc.).”

For a better understanding of individual learning, the related theories are introduced. The three mainstream individual learning theories<sup>6</sup>, according to Hilgard & Bower (1975), Pautzke (1989: 90-97) and Klimecki *et al.* (1991: 128), are:

- (1) the classic learning theory,
- (2) the behaviouristic learning theory and
- (3) the cognitive learning theory.

(1) The **classic learning theory** commenced with Ebbinghaus in the late 19th century. It concentrated on the research of the human reception of knowledge by listening, i.e. the process of acquiring knowledge. rel

As the classic learning theory focused only on speech recognition, new theories were developed, which studied also the changes in the observable behaviour.

(2) The **behaviouristic theory of learning** played a major role during the 1930s and the 1950s. At that time the change in observable behaviour was the focus of research, but with the learning organism treated mainly as a black box. Within a stimulus-response-model researchers investigated whether laws could be derived from observable stimuli and responses of the organism. The theory of behaviourism is divided into “classic” and “operant conditioning”.

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<sup>6</sup> For more learning theories see Shrivastava (1983: 8f) and Hilgard & Bower (1975).



## 2. ORGANIZATIONAL LEARNING

*Classic conditioning* means the research of born and bred behaviour. The best-known research example originated from the Russian scholar Pawlow, who succeeded in replacing a “born reaction” (watering of the mouth) of a dog, which was triggered by an “original stimulus” (offering of food), with a “conditioned reaction”, caused by a “neutral stimulus” (sound of a bell).

With the concept of *operand conditioning*, especially Skinner explored the ties of born and/or socially acquired reactions to stimuli through positive reinforcement. The question was whether usual reactions are changeable by positive incentives.

Behaviourism was later criticised for neglecting the internal processes of the learning subject. Neobehaviourism, which tried to explain the non-observable internal processes by hypothetical constructs, succeeded only partly in addressing this critique.

(3) With the help of **cognitive<sup>7</sup> theories**, whose most important exponent was Piaget, the black-box view of the learning objects was abandoned. As a result, consciousness and its imminent cognitive processes inside the individual were emphasised. The possibilities of action, as well as the change of cognitive structures (thinking and problem solving abilities) of man, were investigated. Cognitive theories form the scientific background of individual learning.

After this presentation of individual learning theories, the next subsection introduces the concept of team learning theory.

### 2.1.2. Team Learning Theory

According to Pawlowsky (1992: 221), team<sup>8</sup> learning has the vital function of knowledge transfer, with which individual learning knowledge is transformed into organizational knowledge, which can then be shared by

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<sup>7</sup> The term “cognitive” is derived from “cognoscere”, which is the Latin word for “knowing”, “realising” or “understanding” (cf. also Menge 1963).

<sup>8</sup> In this thesis the definition elaborated of a team is as follows: “A team is an informal or formal group of at least two people, who act together in order to achieve certain objectives.”

## 2. ORGANIZATIONAL LEARNING

all other organizational members. Senge (1990: 10) goes even further and suggests that “unless teams can learn, the organization cannot learn”.

It is argued here that claiming that only team learning leads to organizational learning might be a too one-sided view, as it would deny the fact that individuals can learn directly for the whole organization as well as for themselves, and can distribute this explicit knowledge acquired through various communication channels. However, the case might look different for tacit (implicit) knowledge, which is best transferred through personal contacts, i.e. in teams (cf. Chapters 8 and 9).

Individual knowledge and individual abilities to learn are combined by team learning, which forms the smallest organizational unit of organizational learning (obviously apart from individuals). The performance depends on individual learning characteristics and on the context of the team within the whole organization. The connective function of team learning achievements plays a major role in the transfer of individual learning to organizational learning (Reber 1992: 1243).

### 2.1.3. Organizational Learning Theory

The different views about organizational learning are presented in a chronological order, as this might come closest to the evolution of theories. How these definitions differ from each other is discussed, and a working definition of organizational learning is elaborated.

One of the first definitions of organizational learning is given by Argyris (1977: 116), which focuses only on the process:

“Organizational learning is a process of detecting and correcting error.”

One year later, Argyris & Schön (1978: 29) suggest the following expanded definition of organizational learning, which adds individual learning and organizational knowledge:

“Organizational learning occurs when members of the organization act as learning agents for the organization, responding to changes in the internal and external environments of the organization by detecting and correcting errors in theory-



## 2. ORGANIZATIONAL LEARNING

in-use and embedding the results of their inquiry in private images and shared maps of the organization.”

Duncan & Weiss (1979: 84) offer a more condensed definition, focusing on the process again, which does not include individuals explicitly, but mentions organizational knowledge:

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process

“Organizational learning is defined here as the process within the organization by which knowledge about action-outcome relationships and the effect of the environment on these relationships is developed.”

Fiol & Lyles (1985: 803) suggest the following definition of organizational learning.:

“Organizational learning means the process of improving actions through better knowledge and understanding.”

This definition includes organizational knowledge, but not individuals as learning agents. It implies the limitation that organizational learning only happens when actions are being improved, but not when it only changes the knowledge of an organization.

Stata (1989: 64) gives a definition which stresses the organizational knowledge base, but leaves the rest out:

“First, organizational learning occurs through shared insights, knowledge and mental models. Second, learning builds on past knowledge and experience - that is, on memory.”

Staehle (1991: 843, original in German) focuses in his definition also on the knowledge base, and includes learning systems:

“Organizational learning is a further development of a knowledge base, which is shared by all members of the organization. A decisive difference between the organization and the individual lies in the fact that organizations have developed more or less as person-independent learning systems.”

However, Staehle’s reference about “more or less person-independent learning systems” in his definition could be misleading, as it might easily be misunderstood that organizational learning can happen without the interplay between individual and organization. It is further argued in this

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## 2. ORGANIZATIONAL LEARNING

thesis that formal systems are not necessarily needed for organizational learning, as organizational learning can also occur in informal ways.

Pawlowsky (1992: 204, original in German) tries to formulate a definition by combining the various different definitions from other authors<sup>9</sup> into one single definition:

“Organizational learning is a process

- that comprises a change in the organizational knowledge base
- that happens in an interplay of individual and organization
- that takes place through the interaction with the internal and/or external environment
- that is executed in view of the governing theory of action
- that leads to an adaptation of the system to the environment
- that helps to gain a higher level of problem solving capacity.”

According to Pawlowsky, there seems to be no other way to do justice to the state of discourse about organizational learning than to combine the different views into a long list. However, it is argued here that, on the one hand, this definition appears to be not precise enough to be operational as a working definition for this thesis and, on the other hand, Pawlowsky also used the definitions of Learning Organizations from Senge and Garratt for his own definition of organizational learning. This is not accurate, because the process (organizational learning) and the subject (the Learning Organization), especially in the perception of an ideal, are two different things and, therefore, cannot be combined. oh?

Furthermore, as will also be later shown in this chapter, organizational learning can also change the governing theory of action (double-loop learning), i.e. not only being executed in the view of it, like Pawlowsky suggests. Organizational learning can be more than mere adaptation, namely anticipation, and it does not necessarily imply a higher level of problem solving capacity, contrary to Pawlowsky's definition. ?

Another definition of organizational learning stems from Kim (1993: 43 and 1993a: 67):

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<sup>9</sup> Quoted by Pawlowsky are Argyris & Schön (1978), Jelineck (1979), March & Olson after Duncan & Weiss (1979), Duncan & Weiss (1979), Hedberg (1981), Morgan (1986), Garratt (1990), Senge (1990), Geißler (1991) and Staehle (1991).



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“Organizational learning is defined as increasing an organization’s capacity to take effective action.”

This definition implies the possibility of improved action, but not the necessity, as opposed to Fiol & Lyles’ definition above. It also only takes individual and organizational knowledge indirectly into account, which is included in most other definitions.

Ulrich *et al.* (1993: 55) also include organizational knowledge only indirectly, as well as new individuals:

“Organizational learning occurs as the systems and culture in the organization retain learning and transfer ideas to new individuals. This kind of learning is shared across organizational boundaries of space, time and hierarchy.”

However, it is not clear, why there should be a limitation only to new individuals, as opposed to all individuals, of an organization.

After having shown this list of definitions, it is not surprising that authors like Garvin (1993: 79f) complain that there is considerable disagreement in terms of definitions of organizational learning<sup>10</sup>. Yet Garvin sums up: “Most scholars view organizational learning as a process that unfolds over time and link it with knowledge acquisition and improved performance. But they differ on other important matters.”

Unfortunately, Garvin does not explain in which important respects he thinks the scholars’ views differ. Again, it is argued in this thesis that an improved performance of the organization might be achieved through organizational learning, but it cannot be seen as a necessary outcome.

The definition of organizational learning by Dixon (1994: 5) goes a step further, calling it an intentional process which leads to an improved performance:

“[Organizational learning is] the intentional use of learning processes at the individual, group and system level to

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<sup>10</sup> Garvin (1993: 80) quotes the definitions from Argyris, Fiol & Lyles, Levitt & March, Stata and Huber. It can be assumed that Garvin did not know Staehle’s and Pawlowsky’s definitions, because they wrote their texts in German only.



## 2. ORGANIZATIONAL LEARNING

continuously transform the organization in a direction that is increasingly satisfying to its stakeholders”

However, Dixon (1994: 5) contradicts herself a few lines later, by stating that all organizations learn to a greater or lesser extent. Even more confusingly, Dixon (1994: XIV) says that organizational learning “can and does occur accidentally”, and not intentionally.

Dixon’s contradictory statements show, like many other definitions in the literature on organizational learning, that there is a slight confusion about whether organizational learning, on the one hand, happens intentionally and, on the other hand, improves the performance of an organization. As a consequence, a working definition of organizational learning is developed for this thesis, which synthesises the different definitions, but also tries to solve the paradox of the statements above.

This thesis concludes that a definition of organizational learning should include the following elements.

The *learning process* itself appears to be an integral part of nearly all definitions mentioned above, starting with Argyris (1977: 116) with a “process of detecting and correcting error”, to Dixon (1994: 5) with “use of learning processes”.

*Knowledge acquisition or generation* refers to the learning process as either incorporating knowledge from outside the organization or creating knowledge inside the organization, mostly by trial-and-error. This is not a reference to the existing definitions, but a new incorporation of insights about organizational learning by Huber (1991) and Dixon (1994) regarding knowledge acquisition and by Nonaka & Takeuchi (1995) regarding knowledge generation. (can not prove hard to follow)

*Individuals* are included as the prerequisite of organizational learning as stated by Argyris & Schön (1978: 29) “members of the organization act as learning agents for the organization”. And Pawlowsky (1992: 204) states that “organizational learning ... happens in an interplay of individual and organization”. However, other authors include individual learning only implicitly. Whereas individuals are a necessary condition for organizational learning to take place, teams are a sufficient but very conducive condition.

*Teams* are included as a further part of the working definition of this thesis. Although it is not explicitly mentioned in the definitions of other

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authors, except the one by Dixon, this is because some authors, such as Pawlowsky (1992: 221), Senge (1990: 10) and Reber (1992: 1243), emphasise the importance of team learning as being conducive to organizational learning. However, it is expressed in the definition formulated below by “can be accomplished” such that teams are only a sufficient condition for organizational learning.

*Organizational knowledge* is also incorporated in the definition given below, as it is included by the majority of authors in the definitions presented above. However, organizational knowledge is seen in this thesis only as a sufficient condition for *organizational actions*, which is expressed by “can improve”, as it does not necessarily lead to improved actions (cf. Kim’s definition (1993: 43 and 1993a: 67), either because the expanded organizational knowledge is not conducive to improve actions<sup>11</sup> or it is not in the organization’s interest to improve its actions<sup>12</sup>.

From the analysis of the literature, this thesis comes to the following working definition:

**Organizational learning** is a process of knowledge acquisition or generation of an organization, performed through individuals, which can be accomplished by teams. It is based on organizational memory that is expanded, which can improve organizational actions.

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After this working definition for organizational learning, a deeper insight into organizational learning will be presented, focusing on the distinction between internal and external organizational learning.

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<sup>11</sup> Huber (1991: 89), e.g., states that organizations “can correctly learn that which is incorrect.”

<sup>12</sup> For example, an organization in a regulated environment can learn that improved organizational action will be penalised by the regulators. In this case organizational learning leads to an expanded organizational knowledge, but rarely to an improvement of organizational action.



## 2. ORGANIZATIONAL LEARNING

### 2.2. External vs. Internal Organizational Learning

Organizational learning can be distinguished between sourced externally (i.e. from outside to inside an organization) and internally (i.e. within an organization).

In order to illuminate how this can look in reality, Dixon's (1992: 32ff) conceptual framework of knowledge acquisition is presented and discussed. Additionally, ways of teaching and learning from Hines (1994) are introduced. Thereby, a structured way of assessing external and internal organizational learning is synthesised and presented.

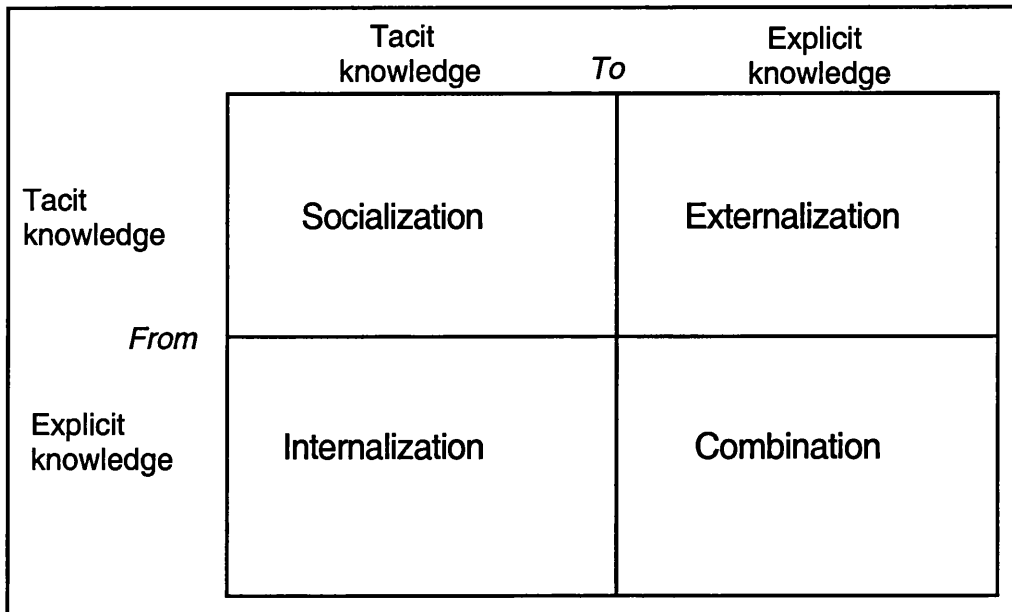
It is argued here that information acquisition has in some cases more the nature of knowledge generation, which is an important distinction not made by the literature mentioned above. Additionally, another useful distinction from Nonaka (1994: 19) is included, who suggests that knowledge should be divided into explicit and tacit knowledge<sup>13</sup>, i.e., implicit knowledge. According to him, there are four different forms of knowledge conversions (see Figure 2.1). These are "combination" (from explicit to explicit knowledge), "internalization" (from explicit to tacit knowledge), "externalization" (from tacit knowledge to explicit knowledge) and "socialization" (from tacit to tacit knowledge). It is argued here that the transfer of tacit knowledge via information (externalization) is a very demanding process and, therefore, does neither happen frequently nor automatically. 8-?

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<sup>13</sup> According to Nonaka (1994: 33) tacit knowledge can be associated with organisational culture and procedures, whereas explicit knowledge occurs in form of documents, filing systems, databases, etc.

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**Figure 2.1: Modes of Knowledge Creation**



Source: Nonaka 1994: 19, and also partially Nonaka & Takeuchi 1995: 72.

The next section starts with external organizational learning and the section thereafter with internal organizational learning.

### 2.2.1. External Organizational Learning

External organizational learning means that an organization acquires or generates new knowledge in an organizational learning process like developed in the section before.

For organizational learning by external information acquisition Dixon (1992: 32ff) has compiled the following list of methods by which information can be acquired: Borrowing (from conferences, consultants and printed materials), searching (by economic, technological or social reports), grafting (by new members, acquisitions or mergers) or collaborating (by joint ventures or consortiums).

There is no doubt that the sources quoted by Dixon are options for external information acquisition. However, the labelling of groups seems to be slightly confusing because, for example, a report could also be under borrowing as well as searching, and consultants could be under grafting as

## 2. ORGANIZATIONAL LEARNING

well as borrowing. Unethical ways of external information acquisition could also be added, which are espionage (e.g., overhearing, paying people money for valuable information or gaining access to sites illegally), which will not be treated here in detail. Moreover, collaboration in form of joint ventures or consortiums can often have the purpose of generating new knowledge, and not only acquisition of existing information. Dixon also fails to mention customers or suppliers as an external source of information.

Hines (1994: 152-59) mentions further ways by which suppliers acquire external knowledge from their customer and vice versa. These he divides into “cross-transfer of staff” and “one-to-one developments”, both of which facilitate the transfer of tacit knowledge.

*Cross-transfer of staff* is a temporary or permanent exchange of employees, common in Japan, which can be in the form of business group integration (long-term transfer of customer’s staff to supplier), strengthening of management (short-term transfer of customer’s staff to supplier), employee release (medium-term transfer of customer’s senior staff to supplier), training and education (short- to medium-term transfer of supplier’s staff to customer), residents engineers (medium-term transfer of supplier’s engineers to the customer for development) and help against shortage of staff (short-term transfer of staff from supplier to customer or from customer to supplier in case of labour shortage).

*One-to-one developments* are said to be especially typical for supplier associations in Japan, and are normally joint problem-solving: on-site training (supplier’s employees are trained on customer’s site), individual suggestions (customer’s suggestions after visit of supplier) or technical or managerial assistance (customer’s assistance to supplier in technical or managerial areas).

External organizational learning is “inter-organizational learning”, which draws special attention to the learning from outside from other organizations. Inter-organizational learning concentrates on the learning of individuals and especially teams with members from other organizations. These teams can be mixed horizontally across different functional departments (cross-functional) as well as vertically across different hierarchical levels (cross-organizational), from two (or more) organizations for joint product improvement, development or production.

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Alternatively, a more informal or formal approach can be taken. Examples for a more formal approach are joint ventures or industrial associations.

All these different forms of external organizational learning seem to exist in reality, however, there is no clear structure according to which this learning could be analysed in reality in a more systematic way. Therefore, this new structure of sources is proposed.

(1) **External organizational learning** can either have the form of (A) external organizational learning of implicit knowledge or (B) external organizational learning of explicit knowledge.

(1A): *External organizational learning of implicit knowledge* can normally only easily be transmitted directly through people and have the form of either

- a) *insiders that turn into outsiders*, such as employees acquiring information from seminars, conferences, associations/clubs, factory visits, social events or joint-development teams of different companies (normally for a short- to medium-term period); or
- b) *outsiders that become insiders*, like information via consultants or coaches from consultancies, academia, customers, suppliers or other organizations; or new employees through hiring, acquisition, merger or joint venture (normally for a medium- to long-term period).

(1B): *External organizational learning of explicit knowledge* which is normally independent of people can be divided into

- a) *prepared material*, from other organizations like social, economic or technical reports and news, as well as other printed or stored material; or
- b) *unprepared material*, where further work needs to be completed so that it is useful, such as, e.g., database research or compiling of special studies.

### 2.2.2. Internal Organizational Learning

Internal organizational learning means that an organization acquires or generates new knowledge inside the organization within an organizational learning cycle like developed in the previous section.

muddled process  
goes back + forth between  
(trial) error,  
new ideas presented  
+ new ideas presented  
the repeats the cycle!

source?  
discuss?



## 2. ORGANIZATIONAL LEARNING

Dixon (1992: 32ff) suggests a list of methods by which internal information can be acquired, which can be congenital (by founders or prevailing technology), experimental (by success or mistakes), experimenting (by R&D or pilot projects), continuous process improvement (by process improvement teams) or critical reflection (by dialogue or questioning assumptions).

Hines (1994: 287) produces more ways of internal organizational learning, such as regular newsletters to keep employees informed or social events, where people can meet and exchange ideas. Although he intended this list to be used by supplier associations (i.e. external organizational learning), internal they can also be used internally.

Again, the sources quoted by Dixon (1992: 32ff) are possibilities of internal organizational learning, not only information acquisition, with a slightly confusing group labelling, which are not mutually exclusive. For example, her lines between experimental and experimenting and between continuous process improvement are not clear. Therefore, a more clear structure was developed, in order to have a more analytical approach that facilitates the understanding of how internal organizational learning is performed in reality.

Internal organizational learning is “intra-organizational learning”, which draws special attention to the learning within an organization. This organizational learning takes place between individuals and/or teams, but within the organization. Here, team learning is focused on the learning inside an organization, and this can happen not only on the same level within a department, but also in a vertical and/or a horizontal way, i.e. between different hierarchies and/or different departments.

(2) **Internal organizational learning** can either have the form of (A) internal organizational learning of implicit knowledge or (B) internal organizational learning of explicit knowledge.

(2A) *Internal organizational learning of implicit knowledge*, can be based on either

a) *individual work in an unstructured approach*, like founders' ideas or spontaneous ideas, successes or mistakes of any employee's project, informal individual R&D; or

not good ← relation  
abstract & concrete  
idea - as  
argument

## 2. ORGANIZATIONAL LEARNING

b) *team work in an unstructured approach*, like questioning assumptions, informal team R&D or pilot projects (i.e. project to test how something on a larger scale would work).

(2B) *Internal organizational learning of explicit knowledge*, which can normally be structured and divided into

a) *individual work in a structured approach*, like systematic and formal individual R&D or employee suggestion systems; or

b) *team work in a structured approach*, like systematic and formal team R&D, team improvement systems for processes or formal dialogues.

In summary, the comparison between external and internal organizational learning shows that it is helpful for the analysis to distinguish the different forms of organizational learning from these points of view. Also, this comprises not only knowledge acquisition, as suggested by Dixon (1992) and Hines (1994), but also knowledge creation, as suggested by Nonaka (1994) or Nonaka & Takeuchi (1995)<sup>14</sup>. This will also prove to be helpful in the empirical analysis of this thesis and an overview is given in Table 2.1.

ok?

vague

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<sup>14</sup> Knowledge conversion in the form of internalization or externalization is only implied implicitly here in order to avoid over-complexity.



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Table 2.1: External vs. Internal Organizational Learning

- (1) External organizational learning:
- (A) **External organizational learning of implicit knowledge**
- a) insiders that turn into outsiders
  - b) outsiders that become insiders
- (B) **External organizational learning of explicit knowledge**
- a) prepared material
  - b) unprepared material
- (2) Internal organizational learning:
- (A) **Internal organizational learning of implicit knowledge**
- a) individual work in an unstructured approach
  - b) team work in an unstructured approach
- (B) **Internal organizational learning of explicit knowledge**
- a) individual work in a structured approach
  - b) team work in a structured approach

This thesis deals with external and internal organizational learning for different reasons. *Inter-organizational learning* is investigated in order to explore how the characteristics of the Learning Organization are acquired and where they originate. *Intra-organizational learning* is researched in order to explore whether the characteristics of the Learning Organization lead to organizational learning outcomes, i.e. the benefits of organizational learning.

The following section gives an overview over a different dimension of organizational learning, which refer to its intensity: the three different levels of organizational learning.

again  
overall  
logic  
hard to  
follow

### 2.3. Three Levels of Organizational Learning<sup>15</sup>

The majority of the literature on organizational learning divides organizational learning into three organizational learning levels. These are

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<sup>15</sup> Cf. also Rosengarten 1993: 10-14.

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displayed in a chronological order in Table 2.2 below. This means that the higher the organizational learning levels, the better their quality, i.e. the more complex tasks can be solved by organizational learning.

Table 2.2: Organizational Learning Levels

<b>Author/s</b>	<b>Learning Level I (Adjustment Learning)</b>	<b>Learning Level II (Change Learning)</b>	<b>Learning Level III (Learning Learning)</b>
Argyris & Schön 1978	Single-Loop Learning	Double-Loop Learning	Deutero-Learning
Miles & Randolph 1980	Reactive Learning	Proactive Learning	
Hedberg 1981	Adjustment Learning	Turnover Learning	Turnaround Learning
Fiol & Lyles 1985	Lower-Level Learning	Higher-Level Learning	
Shrivastava 1983	Adaptive Learning	Assumption Sharing	Development of Knowledge Base
Pautzke 1989	Assimilation	Accommodation*	Equilibration*
Garratt 1990	Operational Learning Cycle	Policy Learning Cycle	Integrated Learning Cycle
Senge 1990	Adaptive Learning	Generative Learning	
Geißler 1991	Mechanistic*	Organismic*	
Klimecki <i>et al.</i> 1991	Mechanistic Learning*	Evolutionary Learning*	Development Learning*
Staehle 1991	Adaptation*	Learning - i.e. Development*	Learning to Learn*
Pawlowsky 1992	Idiosyncratic Learning*	Environment Adaptation*	Problem Solving Learning*
McGill <i>et al.</i> 1992	Adaptive Learning	Generative Learning	
Probst 1992	Adaptation Learning*	Change Learning*	Deutero-Learning
Watkins & Marsick 1993	Action Research	Action Reflection Learning	Action Science

## 2. ORGANIZATIONAL LEARNING

Nevis <i>et al.</i> 1995	Corrective Learning	Generative Learning	
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Source: In reference to Fiol & Lyles (1985: 809) and Pawlowsky (1992: 204) with modifications and supplements (\* = translated from German).

This thesis takes the terminology<sup>16</sup>, i.e. single-loop, double-loop and deutero-learning, of Argyris & Schön from 1978 for three reasons:

Firstly, it is frequently quoted as being the first terminology of three organizational learning levels<sup>17</sup>. Secondly, it is used most frequently in the literature<sup>18</sup>. Thirdly, it is easy to explain by using diagrams.

Argyris and Schön are regarded by Shrivastava (1983: 11ff) as the main representatives of organizational learning as sharing of assumptions. Their importance is also suggested by Thurbin (1994: VII): “The contemporary notion of the learning organization has been developed from work by leading academics Chris Argyris & Donald Schon in 1978.”

Therefore, their theory of organizational learning is explicitly explained, and their learning levels are used as a working definition for this thesis.

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<sup>16</sup> Cf. also Argyris & Schön 1974, Schön 1975, Argyris 1976, Argyris 1977, Argyris & Schön 1978, Argyris 1982, Argyris 1990, Argyris 1991 and Argyris 1993.

<sup>17</sup> This thesis follows the point of view of the majority of authors, which refer to Argyris & Schön 1978 (see following footnote) as the first source of this terminology. However, the fact is acknowledged that the terminology was based on the work of Gregory Bateson's book “Steps to an Ecology of Mind” from 1972, and was published before in previous articles or books by the same authors, e.g., Argyris & Schön 1974, Schön 1975 and Argyris 1976.

<sup>18</sup> Cf., e. g., in an alphabetical order: Argyris (1982: 43ff, 1991: 100, 1993: 5f), Barr *et al.* (1992: 17), Dixon (1992: 42f), Fiol & Lyles (1985: 807f), Garrat (1990: 79ff), Hedberg (1981: 7f), Isaacs (1993: 30), Kim (1993: 44ff and 1993a: 27-46), Klimecki *et al.* (1991: 130-33), Lamming (1993: 101 and 109), Luthans *et al.* (1994: 12), McGill *et al.* (1992: 5), Nevis *et al.* (1995: 74), Nonaka (1994: 19), Pautzke (1989: 109-30), Pawlowsky (1992: 201-13), Pedler *et al.* (1991: 149f and 186), Probst (1992: 473-77), Ross (1992: 19), Shrivastava (1983: 11ff), Staehle (1991: 844f), Ulrich *et al.* (1993: 53) and Watkins & Marsick (1993: 79).

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The **theory of action** forms the basis of the organizational learning model of Argyris and Schön<sup>19</sup>: Organizations act according to an organizational theory of action, which consists of the shared theories of action of the organization's members. Therefore, behind the intended actions of an organization stand general convictions, values and norms. Theory of action is divided into "espoused theory" and "theory-in-use".

The *espoused theory* of an organization is the officially agreed and accepted theory of action, according to which individuals and organizations officially accomplish their actions. The official theory of action can be manifested in leading principles, guidelines or letters of intent.

The *theory-in-use* can only be derived from daily actions, and it may be incompatible with the espoused theory. Therefore, theory-in-use is the theory of action, which guides the daily decisions and behaviour of an organization, carried out by the organizational members, because they are guided by collective rules for decision and delegation. The members of an organization are often not aware of their own theories-in-use and, therefore, these are not easily detectable. As a consequence they have to be carefully observed to be discovered.

If the expectation of actions of an organization does not correspond with the results of that action, an organizational learning process is started. Its course and its three organizational learning levels "single-loop learning", "double-loop learning" and "deutero-learning" are explained next.

### 2.3.1. Single-Loop Learning<sup>20</sup> as Adjustment Learning

The first organizational learning level is labelled **single-loop learning** by Argyris and Schön. This can also be explained as adjustment learning. Single-loop learning takes place when an organization detects and corrects deviations from its target, within the given governing variables or theory-in-use. Therefore, single-loop learning is the correction of the

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<sup>19</sup> Cf. Argyris & Schön 1974: 4-7, Schön 1975: 6f, Argyris 1976: 30, Argyris 1977: 115-19, Argyris & Schön 1978: 10-16, Argyris 1982: 36, Argyris 1990: 23, Argyris 1991: 103 and Argyris 1993: 5-10.

<sup>20</sup> Cf. Argyris 1977: 116, Argyris & Schön 1978: 3, 18ff and 29, Argyris 1982: 43f, Argyris 1990: 92, Argyris 1991: 100, and Argyris 1993: 5.

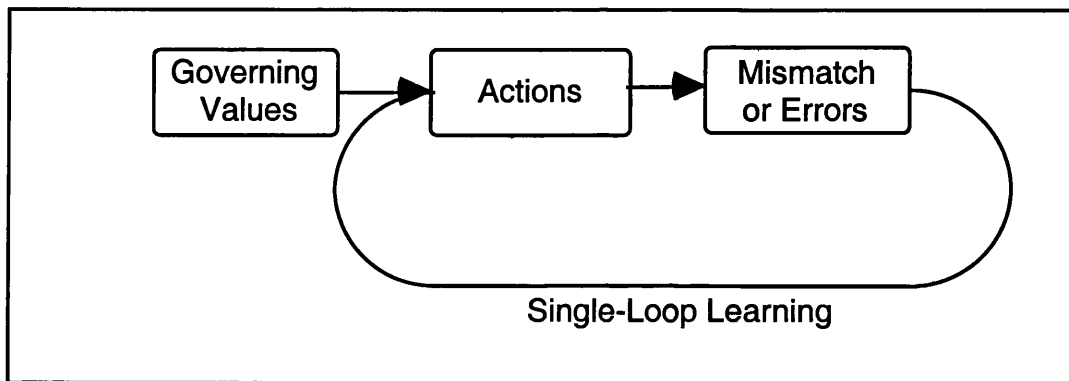
## 2. ORGANIZATIONAL LEARNING

consequences of organizational action that were originally not intended (see Figure 2.2).

Single-loop learning can also be described as a regulating loop that corrects deviations from the aim given.

The essential point is that the governing values, i.e. the existing theory-in-use, are not altered, but only an improvement in **effectiveness** is attained through adjustment within the given frame, set by organizational norms. Therefore, effectiveness is a measure for success of single-loop learning.

Figure 2.2: Single-Loop Learning



Source: In reference to Argyris 1982: 44 and Argyris 1990: 92 with slight modifications by the author of this thesis.

Single-loop learning is explained by Argyris and Schön with a metaphor of a thermostat for a central heating. A thermostat learns when to adjust the heat: if it is too hot, it turns the heat off, and if it is too cold, it turns the heat back on. The performance of this task is dependent on the information about the room temperature, in order to decide whether to take corrective action or not.

Double-loop learning, however, would occur when the thermostat could ask itself why it was set at a certain degree. Thereby, it would be able to question the underlying governing values, and would decide whether a certain room temperature is right for the optimal efficiency (cf. Argyris 1993: 5).

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This double-loop learning will be explained in the following subsection, as a higher level of organizational learning.

### 2.3.2. Double-Loop Learning<sup>21</sup> as Change Learning

Argyris & Schön call the second highest organizational learning level **double-loop learning**, which can also be described as change learning. Double-loop learning takes place when the governing values are questioned and changed, because the regulation of the learning process within the single-loop learning process does not appear to be sufficient anymore. Thus, the organization's governing values, i.e. underlying norms, policies and objectives, are modified, which will lead to a different set of possible action. (see Figure 2.3)

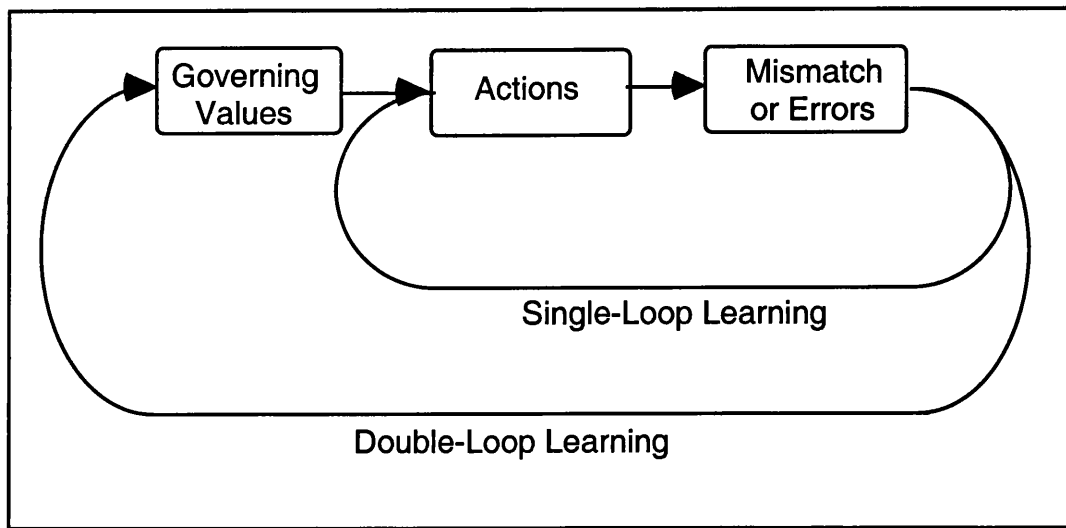
The question of which new theories of action are adopted, often depends on what power positions the different competing opinions have within an organization. In any case, the **problem-solving capability** of the organization is likely to increase every time double-loop learning takes place. Therefore, double-loop learning can be described as an amplifying loop.

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<sup>21</sup> Cf. Argyris 1977: 116, Argyris & Schön 1978: 3, 20-26 and 29, Argyris 1982: 43f, Argyris 1990: 93f, Argyris 1991: 100 and Argyris 1993: 5.

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**Figure 2.3:** Double-Loop Learning



Source: In reference to Argyris 1982: 44 and Argyris 1990: 94 with slight modifications by the author of this thesis.

According to Staehle (1991: 846), alternative problem-solving has a chance to be accepted only if the members of the organization believe that they can more easily attain their targets by this. Chances for a change in the paradigm increase to the same extent as the gap between intended and actual results widens. That means, if single-loop learning is no longer sufficient to reach the goal, or at least the minimum aim (survival), then the governing values are changed within the framework of double-loop learning.

Both types of organizational learning can be analysed through deutero-learning, which is presented in the next part.

### 2.3.3. Deutero-Learning<sup>22</sup> as Learning Learning

The third, and highest, organizational learning level of the organizational learning model from Argyris & Schön is **deutero-**

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<sup>22</sup> Cf. Argyris & Schön 1978: 26-29, 308. "Deutero" stems from ancient Greek word "δεύτερος" and means "second" (Menge 1976).

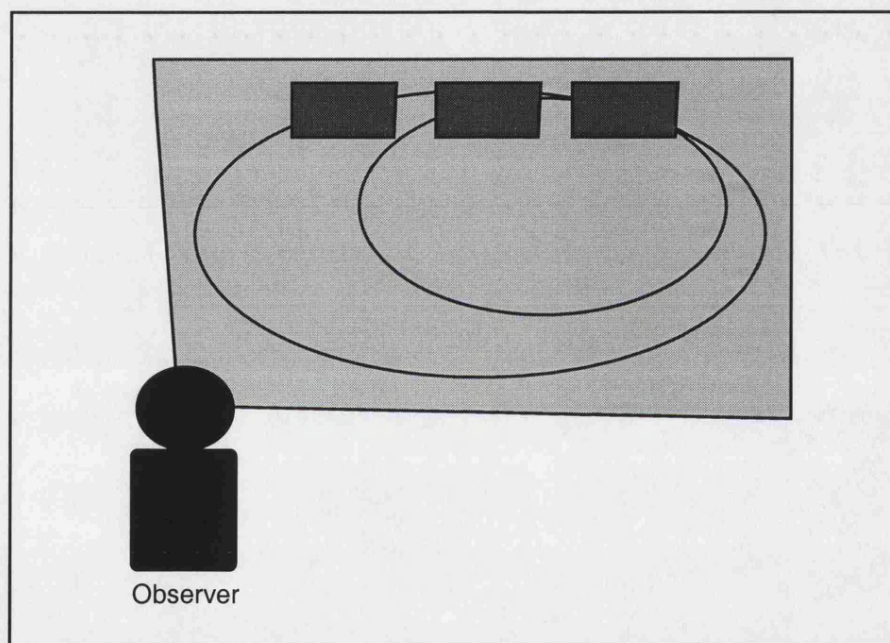


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**learning**<sup>23</sup>, which can be regarded as learning learning, i.e. learning to learn. Deutero-learning has to be understood as a process, wherein the single-loop learning and double-loop learning processes are considered and reflected by at least one observer of the organization (see Figure 2.4).

Deutero-learning enables the learning and improving of organizational learning processes on the level of single-loop and/or double-loop learning. The thorough reflection of the learning context, the removal of learning impediments and the promotion of learning supporting mechanisms are essential for successful organizational learning.

Figure 2.4: Deutero-Learning



Argyris & Schön (1978: 308) admit, however, that organizational learning is normally limited to single-loop learning, and does not engage in double-loop learning. And they also suggest that deutero-learning is predominantly used for reflection about single-loop learning, and not double-loop learning.

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<sup>23</sup> Hedberg (1981: 8) and Ulrich et al (1993: 53) equate in their work double-loop learning and deutero-learning, which is not correct.



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A practical application of the three different learning levels would be the case of a typical European organization which finds too many defects in its products. Single-loop learning would apply to the increase of inspection, which would be learning within the normal governing values. Double-loop learning would be a change towards organizational learning systems for employees or teams, and delegating the quality control to the shopfloor, thus copying the successful Japanese way of production. Deutero-learning would try to learn from the analysis of the performance of learning on both levels and try to improve them, as well as implement the lessons learnt in other areas of the organization.

Single-loop learning, double-loop learning and deutero-learning, are divided by Argyris & Schön (1978: 22, 27)<sup>24</sup> into four phases of an organizational learning cycle, which are discovery of problems, invention of a solution, production and evaluation, and generalization of outcome.

This and further organizational learning cycles are explained in a later section of this chapter. Before that this thesis will look at the factors which initiate organizational learning.

### 2.4. Initiating Factors of Organizational Learning

The current literature mentions either opportunities or threats as the initiating factors of organizational learning.

Argyris & Schön (1978: 308) suggest:

“Changes in the norms of organizational theory of action, or in central elements of organizational theory-in-use, tend to occur through the eruptions consequent on ecological adjustment and in the face of change in organizational environments.”

That means that according to them double-loop learning only tends to occur after new opportunities or threats.

Although opportunities or threats appear to be necessary conditions, they are generally not sufficient alone as initiating factors. A sufficient

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<sup>24</sup> Cf. also Pautzke 1989: 129 and Staehle 1991: 854.

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condition is only seen to be given with the help of the right people in the right positions as catalysts and they can be either insiders or outsiders.<sup>25</sup>

### 2.4.1. Opportunities as Initiating Factors for Organizational Learning

**Opportunities** can induce organizational learning. An organizational reserve, i.e. slack, is necessary in order to explore the environment and to experiment with innovative projects. But only few successful organizations with the necessary reserve seem to do this in reality. The reason might be the fact that success seems to confirm the momentary theories-in-use, and does not make the organization inclined to try new strategies (Cyert & March 1963: 41ff). Neither shortage of resources, great problems, nor a favourable environment constitute a good climate for learning. Low organizational resource slack can induce a search for new opportunities, but, paradoxically, a resource surplus is needed for the implementation for a new theory of action (cf. Hedberg 1981: 17).

### 2.4.2. Threats as Initiating Factors for Organizational Learning

**Threats**<sup>26</sup> can also be initiating factors for a learning process. Hedberg (1981: 16) is of the opinion that learning is normally initiated by problems.

Argyris (1977: 117) suggests that double-loop learning occurs because of “a crisis precipitated by some event in the environment (for example, a recession or a competitor producing a better product)”. He also states that “a crisis created by existing management in order to shake up the organization” can also induce organizational double-loop learning.

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<sup>25</sup> Additionally to opportunities and threats, some authors (cf. Hedberg 1981: 3-23 and Nystrom & Starbuck 1984: 53-65, but also Klimecki *et al.* 1991: 133 and Staehle 1991: 846) claim that an organization has to go through a process of *unlearning* the old habits in order to learn new knowledge and behaviour. This organizational unlearning is often characterised by the departure of the old top management and organizational learning by the arrival of the new top management. However, as both are normally part of the same organizational adjustment, Hedberg (1981: 18) admits that “[u]nlearning and triggering of learning can thus be intimately related and sometimes overlapping phenomena.”

<sup>26</sup> Threats normally evolve to problems or crises in organizations and, thus, will be treated synonymously with problems and crises in this thesis.

All over the place !

## 2. ORGANIZATIONAL LEARNING

However, due to the fact that there are perception filters, problems are not easily detected. Therefore, many organizations do not react to problems early enough. Mainly minor problems are tolerated, which aggregated, have a greater impact on the viability of an organization. In the long run, this can lead to a decline in organizational performance because the problems are often perceived too late.<sup>27</sup> This leads to a belated reaction in reality, where in turn the reserves tend to be too exhausted to induce a suitable, long-lasting turnaround (Hedberg 1981: 16f).

### 2.4.3. People as Initiating Factors for Organizational Learning

**People** in the right position, as insiders or outsiders of an organization, can be seen as catalysts for turning opportunities or threats into organizational learning. They can induce this through their knowledge and actions (Hedberg 1981: 17f, cf. also Pautzke 1989: 121).

still seen  
as organized  
is  
-Ops  
Threats  
-People?  
(what  
kind of  
work  
this is)

Argyris (1977: 117) mentions people, as a condition for organizational double-loop learning, either as “a revolution from within (a new management) or from without (political interference or takeover)”. For example, a leadership crisis which leads to a change of leadership, i.e. an outsider enters, often takes place together with a financial crisis. This crisis can then facilitate in practice a fast “unlearning” of present theories and implementation of a new frame of action. In this respect, an organizational unlearning is symbolised by the exit of the former leader; the successor then is the trigger for the new organizational learning process.

There can also be different outsiders triggering organizational learning. They can be in the form of various shareholders or stakeholders of the organization, e.g., outside directors of the board, environmental groups, a take-over company or a governmental department.

After having presented different factors which initiate organizational learning, the next section deals with the factors which enforce or obstruct organizational learning.

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<sup>27</sup> Cf. also Senge's (1990a: 22f) “boiled frog-syndrome”: When a frog is thrown into hot water, it will jump outside; but if the frog is put in cold water, which is gradually heated, the frog will stay in the water and get boiled.

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### 2.5. Factors that Enforce or Obstruct Organizational Learning

The empirical and conceptual borderline between triggers and enforcers is smaller and more blurred than this section and previous one might suggest. However, it is obvious that triggers tend to play a more important role in the beginning of an organizational learning process, whereas enforcers tend to play a more important role during the organizational learning process. The literature suggests various factors which enforce or obstruct organizational learning. This section has a closer look at them, starting with the factors that enforce organizational learning.

#### 2.5.1. Factors that Enforce Organizational Learning

?

There are various factors that enforce learning, which are mentioned in the literature. Three of them are predominantly referred to, which are

- (1) difference in opinions,
- (2) thinking in alternatives and
- (3) promoting of experimentation.

(1): Nystrom & Starbuck (1984: 59ff) and Staehle (1991: 846) suggest that **difference in opinions** within organizations, i.e. discord about aims and strategies, are essential factors that should not be suppressed. A too conformist behaviour should neither be promoted, as it makes organizations blind to changes in the environment.

Dynamic balances can be achieved by special interacting processes of dual-management groups, i.e. management in duplicate, in order to provide a continuous platform of dialectics, competing world views and alternative actions (Hedberg 1981:22).

However, this might be the provision of slack not many companies might be able to afford, as well as the negative side effects of competition between the teams can outweigh the benefits of this competition.

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Klimecki *et al.* (1991: 138-47) also make suggestions on how to improve organizational learning. Within a *heterarchy*<sup>28</sup>, i.e. a flowing hierarchy, interactive achievements within the organization are considered.

Through “prosociality” (Klimecki *et al.* 1991: 141f) interpersonal relationships are stressed. Presuppositions for this are mutual acceptance, trust and tolerance. By this, the common purpose of an organization is constantly generated by all members of the organization, and is not imposed from above. Only true participation accomplishes that the concerned actively take part in the decision-making process, and in cases of diverging opinions, they have to be able to voice dissent. Opportunities to participate in the decision-making process need to be available on a permanent basis in order to be effective.

Different opinions can also help thinking in alternatives. This is described next.

(2): **Thinking in alternatives**, i.e. alternative scenarios<sup>29</sup>, including all sorts of possible consequences for the present and the future, provides flexibility through new learning opportunities. This is important, as organizational learning processes need sufficient time and resources (Reber 1992: 1251).

Regulating awareness for signals of change in order to enhance sensitivity is done by the removal of some *perceptual filters*<sup>30</sup>. This can be promoted, for example, by choosing certain people, who are flexible in their view about the environment. However, the organization needs to keep some perception filters, in order to avoid an overload of stimuli (Hedberg 1981: 21f).

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<sup>28</sup> In a heterarchy everybody concerned is a potential designer of the organization. The benefits of management’s achievements are spread throughout the whole system, and are not only the privilege of the professional designer, normally the manager. Management takes place permanently within the whole system. An organization with potential to develop has to be structured heterarchically, in order to be able to use all its potential (Klimecki *et al.* 1991: 138).

<sup>29</sup> See also de Geus’ article (1989: 28-34) with examples for thinking in alternatives in the oil industry.

<sup>30</sup> Perceptual filters are norms and measures. With their help organizational members interpret stimuli (cf. Hedberg 1981: 8). Thus, organizations and their members only react to information that they think is important for the organization.

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According to Staehle (1991a: 313-42), redundancy and slack help thinking in alternatives. *Redundancy* means verbosity, repetition or duplication of information or tasks (cf. also Nonaka & Takeuchi 1995: 80ff). This way, the security and lucidity of information transfer is guaranteed. *Slack* describes an abundance of resources within an organization (e.g., knowledge, money, time or employees), which serves to give the organization a greater potential ability to react within times of crisis. Hereby, attention has to be paid to the fact that neither too much nor too little slack is of advantage to the organization.

Thinking in alternatives is labelled by Klimecki *et al.* (1991: 140f) as “proactivity”, which is accomplished in order to maximise potential chances and possibilities. Thus, activities are anticipated and dominated by foresight, because new potentials are recognised early enough.

**(3): Promoting of experimentation** begins with the selection of organizational members, who are interested in experimenting and are not averse to uncertainty. Also, the reward systems have to be designed in a way to foster experimentation (Hedberg 1981: 20f).

The patterns of new thinking and action should be tested in a limited area, which facilitates the organizational learning process. If the trial and error strategy turns out to be successful, the experience can be applied to the whole organization (Nystrom & Starbuck 1984: 62ff and Staehle 1991: 846).

*Loose coupling*, in opposition to a rigid organization, where teams and departments work closely together, enables an organization to work with a lower probability of disturbance. Due to the fact that mistakes and troubles are solved by small units autonomously, they only have a weak influence on other units. Thus, higher tolerance of mistakes is achieved, which creates an experiment-friendly environment (Staehle 1991a: 313-42 and Klimecki *et al.* 1991: 143-47).

In summary, difference of opinions, thinking in alternatives and promotion of experimentation are three factors which appear to enforce organizational learning. These three factors are related to each other and, therefore, influence each other.

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The absence of the factors that enforce learning has a considerable obstructing impact on organizational learning.

Without *difference in opinions* it is difficult to learn something new. People who always say “yes” confirm the status-quo although it should be constantly challenged and, thereby, they are obstruct learning.

The same applies to *thinking in alternatives*. Without this, the human brain becomes inflexible and cannot learn new things, which can be essential to know in times of turmoil, when time to think and learn is only available in a limited way.

The opposite, i.e. thinking along the lines of “one-best-way”, loses the learning ability and, therefore, the flexibility of an organization.

Without *promoting of experimentation* only a few experiments will be made for the sake of organizational learning from new experiences.

However, there are some theories of authors which identify certain factors that obstruct organizational learning, which are not just a converse of triggers and/or enforcers. These will be discussed next.

### 2.5.2. Factors that Obstruct Organizational Learning

This sub-section deals with three factors that obstruct organizational learning. They are

- (1) double bind,
- (2) defensive routines and
- (3) anxiety I.

(1): Argyris & Schön (1978: 3ff, 86-127) and Argyris (1990: 45f) suggest a situation that obstructs learning, labelled **double bind** (i.e., whatever you do is wrong). This describes a circumstance in which a person, or a group of people, is not able to change a situation, which is inhibiting organizational learning, because of organizational norms. This is especially the case with incorrigible errors, which cannot be solved through simple single-loop learning. The exposure of the error would question the norms of the organization, which might lead to hiding that

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error. But not disclosing the error will be an obstacle to organizational learning.

In some cases, when the double binds in organizations are not discussible, the situation gets even worse for organizational learning. This reduces performance, commitment and concern for the organization. According to Argyris and Schön, organizations normally tend to create learning environments, which discourage organizational learning through its norms and objectives. In order to stress this, Argyris & Schön (1978: 5) even warn: “Unless people acting as agents for organizations and societies are able to learn how to detect and correct double-loop errors, the survival of the society may be in doubt.” Although this statement may be a little overdrawn, it stresses the point that organizations normally do not learn automatically.

(2): Argyris (1986: 541, 1989: 7 and 1990: 43, 46) developed another concept for learning obstacles, which he calls **defensive routines**. These are generated by the organization and its members, in order to defend themselves against dangers. Defensive routines are all actions and intentions that save the organization from danger or damage. However, at the same time defensive routines hinder the organization’s ability to learn how possible causes of dangers can be removed. Organizational defensive routines support overprotection and, thereby, prevent organizational learning.

For two reasons individuals feel helpless to change organizational defensive routines. Firstly, there is a feeling that it is hopeless to change, because this attempt will reinforce defensive routines. Secondly, there is the fear of being punished for trying to alter defensive routines, whereas the opposite reaction of doing nothing tends not to be punished (Argyris 1990: 43).

(3): Schein (1993: 86-92) suggests that there is an anxiety to learn. He calls it **anxiety I**, which is “the feeling that is associated with an inability or unwillingness to learn something new because it appears too difficult or disruptive.” This anxiety is normally eluded by denying the problem, i.e. double bind, by simplifying it.

In order to overcome anxiety I, the leaders of an organization must create an anxiety that is greater than anxiety I, which is labelled anxiety II. It is “the fear, shame, or guilt associated with not learning anything new”



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(Schein 1993: 89), because the continuation of the usual procedure is assumed to lead to failure. However, members of the organization have to feel psychologically safe, i.e. the leader must show them a manageable path forwards.

In summary, this section introduced the factors which enforce or obstruct organizational learning. In order to understand their nature, the next section deals with organizational memory, which is the underlying knowledge of organizational learning.

huh?

### 2.6. Organizational Memory

The term “organizational memory”<sup>31</sup> might be criticised by some readers as not existent. However, this term should be seen as a metaphor for the ability of an organization to store knowledge. In this section, after presenting various views about organizational memory, different definitions are discussed and a working definition for organizational memory is developed.

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#### 2.6.1. Views of Organizational Memory

This section shows with the help of examples that organizational memory can be classified in different ways, which are (1) implicit & explicit organizational memory, (2) internal & external organizational memory and (3) directly & indirectly available organizational memory.

(1): The literature on organizational learning offers a great choice of different forms of organizational memory, which can be divided into implicit, i.e. tacit, memory and explicit memory (cf. also Nonaka 1994: 33), as depicted in Table 2.3.

**Implicit organizational memory**, in this thesis, is the description of storage of implicit organizational knowledge that dominantly resides in the minds of the organization’s employees. There are various forms, starting from world views about organizational cultures to standard

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<sup>31</sup> In this thesis the terms “organizational memory” and “organizational knowledge” have the same connotation.

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operation procedures. These immaterial memories can be implicitly held or explicitly stated, and can also be expressed by explicit memory.

**Explicit organizational memory**, in this thesis, is the label for informative storage forms, which are stored independently of organizational members. However, only a few authors such as Argyris & Schön (1978: 160), Kim (1993a: 71), Dixon (1992: 43ff) and Nonaka (1994: 33) relate expressly to explicit organizational memory, such as documents and reports, files and records or computer data and expert systems, i.e. information software.

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**Table 2.3: Forms of Organizational Memory/Knowledge**

<u>Implicit Organizational Memory/Knowledge:</u>	
- Organizational culture	Hedberg 1981: 6, Pautzke 1989: 78, Dixon 1992: 43ff, Nonaka 1994: 33
- Mental maps and models	Hedberg 1981: 6, Kim 1993: 43 and 1993a: 71
- World views	Nystrom & Starbuck 1984: 55, Pautzke 1989: 78, Kim 1993: 45 and 1993a: 73f
- Meaning of life models	Pautzke 1989: 78
- Theories of actions	Argyris & Schön 1978: 10ff, cf. also Pawlowsky 1992: 202, Dixon 1992: 43
- Norms & Values	Hedberg 1981: 6, Pawlowsky 1992: 202
- Customs & Rituals	Hedberg 1981: 6, Nystrom & Starbuck 1984: 55
- Symbols	Hedberg 1981: 6, Nystrom & Starbuck 1984: 55
- Myths & Sagas	Hedberg 1981: 6, Nystrom & Starbuck 1984: 55, Pawlowsky 1992: 202
- Policies	Stata 1989: 64, Dixon 1992: 43
- Strategies	Stata 1989: 64
- Behaviour	Hedberg 1981: 6
- Work instructions	Pawlowsky 1992: 202
- Standard operation procedures (SOPs)	Hedberg 1981: 6, Pawlowsky 1992: 202, Kim 1993: 45 and 1993a: 73f, Nonaka 1994: 33
<u>Explicit Organizational Memory/Knowledge:</u>	
- Documents & reports	Argyris & Schön 1978: 160, Kim 1993: 43 and 1993a: 71, Dixon 1992: 43, Nonaka 1994: 33
- Files & records	Argyris & Schön 1978: 160, Kim 1993: 43 and 1993a: 71, Dixon 1992: 43, Nonaka 1994: 33
- Computer data & expert systems	Argyris & Schön 1978: 160, Kim 1993: 43 and 1993a: 71, Dixon 1992: 43, Nonaka 1994: 33

(2): Organizational memory can, however, also be divided into internal and external organizational memory (cf. also Dixon 1992: 43).

**Internal organizational memory** is all memory that an organization keeps within itself in immaterial or material form, i.e. inside the heads of the organization's employees or inside organization's documents, files, or computers.

**External organizational memory**, however, comprises all knowledge that is outside the organization, but retrievable. This memory may reside in competing or co-operating organizations, publicly-available

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official records, commercial databases and with former organizational members.

(3): Organizational memory can, lastly, also be classified according to whether it is directly or indirectly available to the organization (cf. also Pautzke 1989: 63-88).

**Directly available organizational memory** is labelled “actual knowledge base”, and includes only the individual knowledge that is available to the organization. The core part of this knowledge is shared by all members of the organization.

**Indirectly available organizational memory** is called “latent knowledge base”, and comprises knowledge of the organizational members, as well as of the environment, which is not directly available to the organization. It is only potentially available knowledge to the organization.

In the “layered model”<sup>32</sup> by Pautzke (1989: 63-88), additionally to the various classification of organizational memory introduced above, “cosmic knowledge” is included, which is not part of the organizational knowledge base, i.e. organizational memory (see Figure 2.5). This is because Pautzke defines organizational memory as the existence of knowledge that is somehow available to the organization.

The layer model gives no clue as to how organizational memory looks in reality. This can only be concluded by the views given before. The directly available organizational memory, plus the individual knowledge which is not directly available to the organization, equates with the *internal organizational memory*.

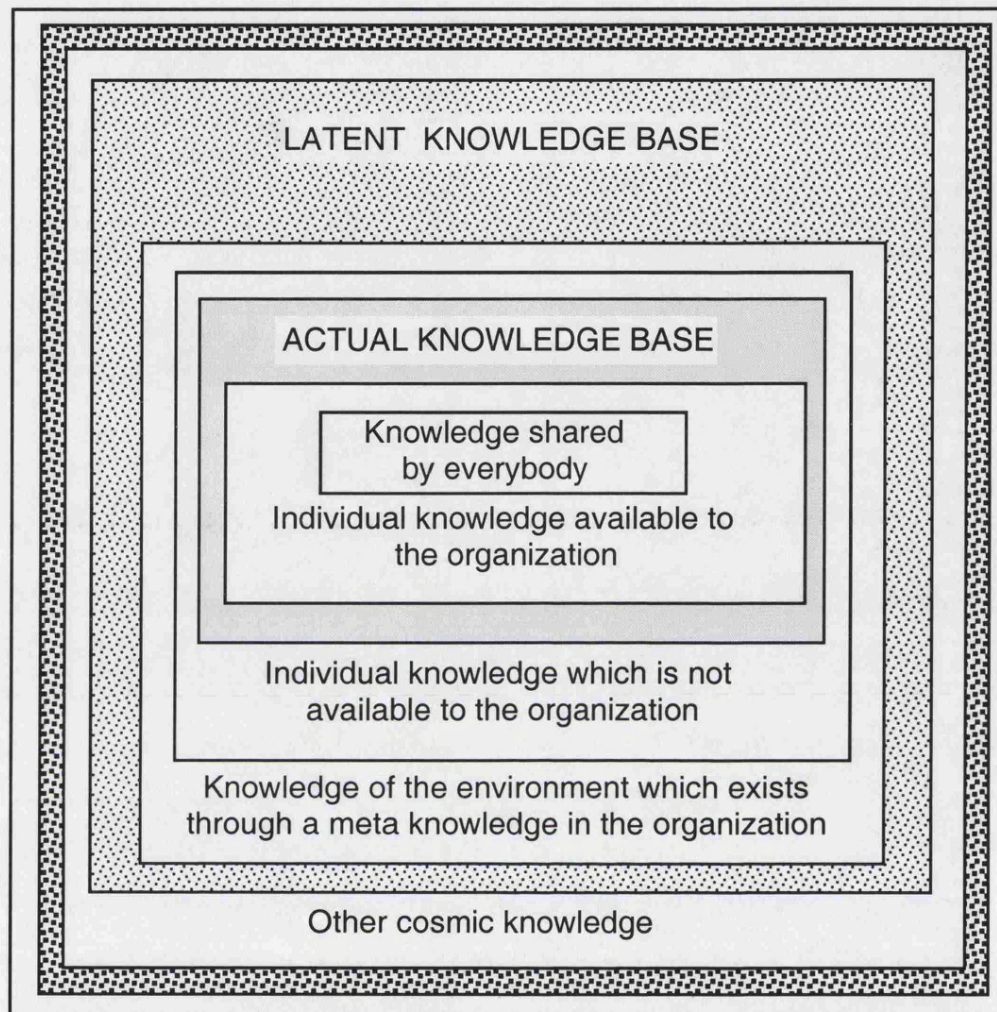
Organizational learning takes place in this layered model by flows of learning from outer levels to the inner levels of organizational memory. There is a circular learning process inside the centre of the layers model, which is called “knowledge shared by everybody” (cf. Pautzke 1989: 111-32).

<sup>32</sup> “Schichtenmodell” in German.



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Figure 2.5: Layered Model of the Organizational Knowledge Base



Source: Pautzke 1989: 79, translated from German with minor modifications.

After having presented three distinct views about organizational memory, definitions of organizational memory are discussed.

### 2.6.2. Definitions of Organizational Memory

Argyris & Schön (1978: 160) focus only on maps of the past and define organizational memory as follows:



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“Organizational memory is a type of map, a map of the organization’s past.”

Although the definition of Argyris & Schön has the advantage of being very short, this may also be a disadvantage, as it is incomplete and does not recognise individual knowledge gained from somewhere else.

Hedberg (1981: 6) stresses the perception that an organization has not only its own way of learning, but also its own knowledge storage, which is different from that of its organizational members:

“Organizations do not have brains, but they have cognitive systems and memories. As individuals develop their personalities, personal habits and beliefs over time, organizations develop world views and ideologies. Members can come and go and leadership changes, but organizations’ memories preserve certain behaviours, mental maps, norms and values over time.”

However, this definition has also to be criticised for its incompleteness and inconsistency. On the one hand, it shows that Hedberg does not take explicit organizational memory as presented above into account, such as documents, files or computer data, which are an important way to make an organization independent of the fluctuation of its members. On the other hand, the definition might give the impression that the organization is totally independent of its members, which is not always the case, especially if it relies mainly on implicit organizational memory which resides in its members.

Another definition of organizational memory originates from Kim (1993: 43 and 1993a: 71). It says that organizational memory may contain information which is scattered and accessible to the agents of organizational learning, however, only inside the organization:

“Organizational memory, broadly defined, includes everything that is contained in an organization that is somehow retrievable.”

The idea of Argyris & Schön (1978: 160) to present organizational maps as organizational memory which are merged from individual maps, is also taken up by Kim (1993: 43 and 1993a: 71), who calls it shared mental models. Kim (1993: 44f and 1993a: 69-74) divides shared mental models into “Weltanschauung” (German word for “world view”), made from

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individual frameworks, and “organizational routines”, assembled from individual routines.

Problems can arise if the memory of an organization is mainly based on the memories of its members. If the organization is only dependent on individuals, it risks losing experience acquired expensively, and, thereby, parts of its memory, if organizational members leave the organization (cf. also Stata 1989: 64). It is argued in this thesis that this is mainly the case with Learning Organizations, as they rely heavily on people as organizational memory. Therefore, it is especially important for these types of organizations to create a commitment of their employees, in order to retain them for a long period. This can be achieved, for example, by a salary which is above average and internal opportunities for personal growth. / oh?

After discussing different definitions for the organizational memory, the following working definition, which limits memory to internal knowledge, in order to be operationalizeable, is developed here:

**“Organizational memory** is normally defined as the internal implicit and explicit knowledge of an organization, which is directly or indirectly available to the organization.”

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The next section deals with different forms of organizational learning cycles, and provides a synthesis at the end, which combines most of the components discussed so far.

### 2.7. Organizational Learning Cycles

The previous sections introduced the theories for three types of learning (individual, team and organizational learning), the three organizational learning levels (single-loop, double-loop and deutero-learning), the factors which induce, enforce and obstruct organizational learning, as well as the concept for organizational memory. This section develops an integrated model of these elements, which is developed after presenting the organizational learning cycles by other authors.

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There are various organizational learning cycles. Their quality depends on whether they are on the organizational single-loop or double-loop learning level, as explained above in this chapter. Single-loop learning can be described as a *regulating loop* that corrects deviations from the given aim. Double-loop learning, however, as a higher level learning, can be described as an *amplifying loop*.

Organizational learning cycles are presented in three groups. The first group consists of “basic organizational learning cycles”, which only take place at the organizational level. The second group gets more specific with “advanced learning cycles”, which encompass the different levels of the organization, i.e. the individual and the organizational level. This is also the case with the third group of “advanced learning cycles with memory”, which additionally includes the existence of organizational memory or knowledge.

### 2.7.1. Basic Organizational Learning Cycles

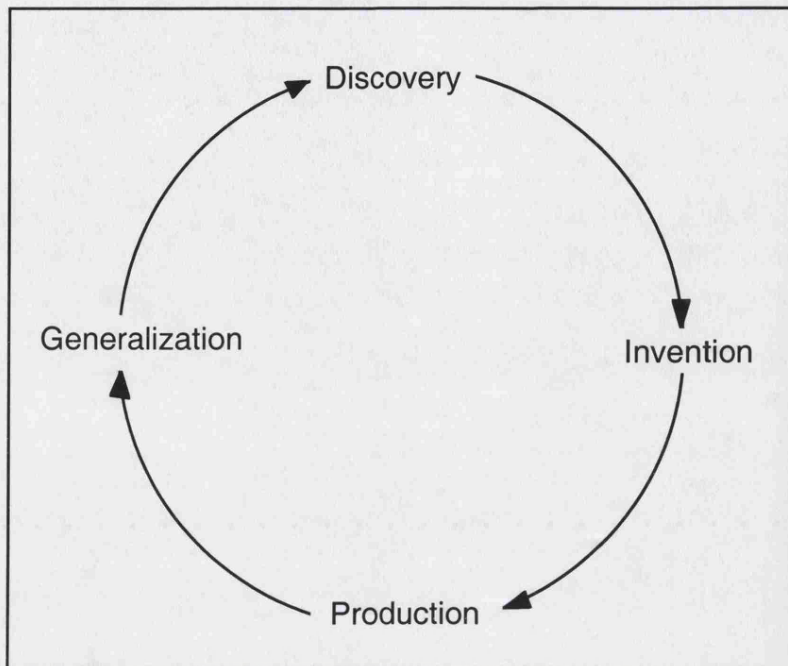
This section, which presents four different basic organizational learning cycles, describes learning only on an organizational level.

The first basic organizational learning cycle by Argyris & Schön (1978: 22, 27 and 141f) divides a organizational learning cycle into four phases (see Figure 2.6). Firstly, organizational members “discover” errors or problems by carrying out a collaborative inquiry. Secondly, they “invent” new strategies, designed to correct the error or solve the problem. Thirdly, these strategies are “produced” or implemented. And lastly, an evaluation and “generalization” of the implementation is made.



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Figure 2.6: The Organizational Learning Cycle by Argyris and Schön



Source: In reference to Argyris & Schön 1978: 141, with slight changes.

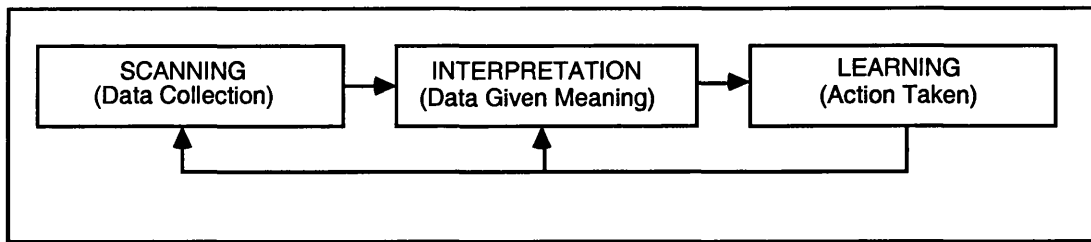
The second basic organizational learning cycle comes from Draft & Weick (1984: 284-95) (see Figure 2.7). It starts with “scanning”, which means data collection about the environment through monitoring. Then, with the help of “interpretation” concepts and theories are developed to enlighten the data with a meaning, which is shared among top management. In the end, “learning” takes place when action is taken on the basis of the knowledge gained from scanning and interpretation.

Then, the cycle can be re-entered through scanning or interpretation, a choice that is not possible within the organizational learning cycles of other authors. However, Draft & Weick focus particularly on the interpretation only by the higher management level, which might appear a limited view for organizational learning, as this can be done by experts or opinion leaders in the organization as well.

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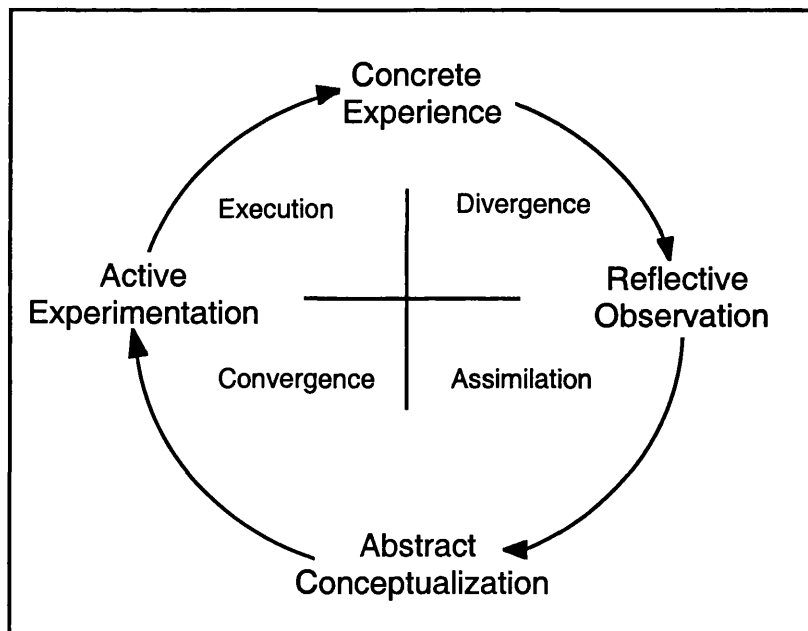
**Figure 2.7:** The Organizational Learning Cycle by Draft & Weick



Source: Draft & Weick 1984: 286.

In the third basic organizational learning cycle Carlsson *et al.* (1995: 65-75) divide organizational learning into four steps (see Figure 2.8), which they base on the experimental individual learning cycle from Kolb (cf., e.g., 1984).

**Figure 2.8:** The Organizational Learning Cycle by Carlsson *et al.*



Source: Carlsson *et al.* 1995: 67, with omissions by the author of this thesis.

The “concrete experience” is the basis on which to start with. It is examined by “reflective observation” in the next step. Then, an “abstract



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conceptualization” is performed to embed the observations into a theoretical framework. Lastly, these theories are used to guide further “active experimentation”. This enables the organization and its members to gain new insights and experiences to go through the learning cycle again.

For the fourth basic organizational learning cycle by Nevis *et al.* (1995: 74) the organizational learning process consists of three steps. Firstly, through “knowledge acquisition” skills, insights or relationships are developed. Secondly, with “knowledge sharing” everybody receives the information that has been acquired by others. Lastly, “knowledge utilization” takes place, which means that learning is integrated and, thereby, available to everybody and can be applied to new situations.

The organizational learning cycles described above generally consist of three to four different steps. They are summarised in Table 2.4 below. Step I deals with the organizational learning input, step II and III with the learning throughput and step IV with the organizational learning output of the basic organizational learning cycle.

**Table 2.4:** Basic Organizational Learning Cycles

Author/s	Step I	Step II	Step III	Step IV
Argyris & Schön 1978	Discovery	Invention	Production	Generalization
Draft & Weick 1984	Scanning	Interpretation		Learning
Carlsson <i>et al.</i> 1995	Concrete Experience	Reflective Observation	Abstract Conceptualization	Active Experimentation
Nevis <i>et al.</i> 1995	Acquisition	Sharing		Generalization

However, these organizational learning cycles all have in common that they neither include individual learning nor team learning as an important part of organizational learning, nor organizational knowledge.

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### 2.7.2. Advanced Organizational Learning Cycles

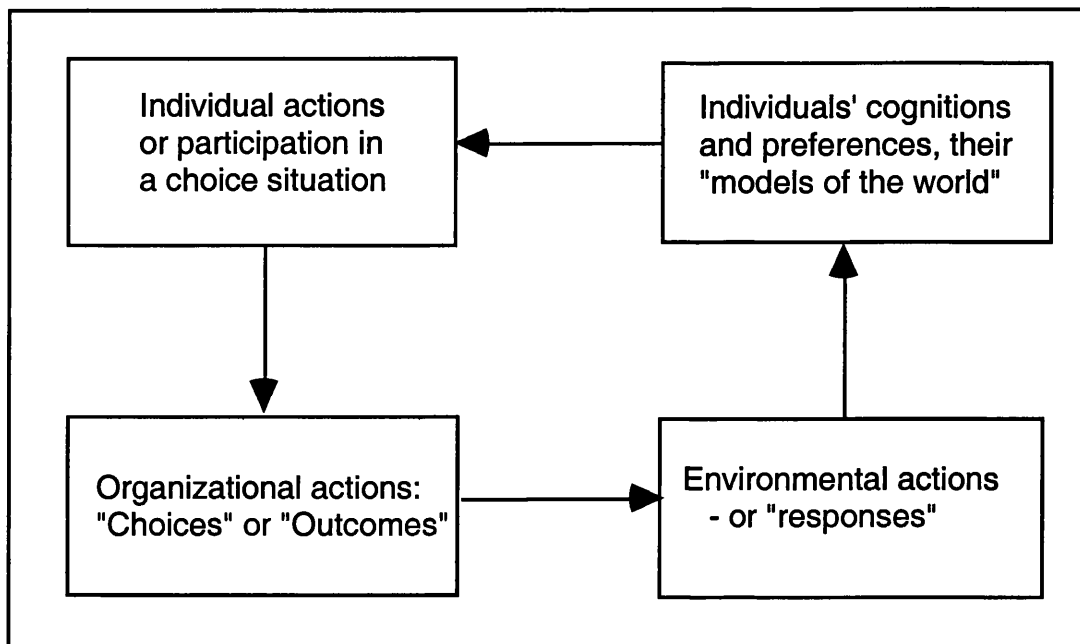
The second group of organizational learning cycles is called “advanced”, because it comprises, besides organizational learning and action, also individual learning.

One of the first advanced organizational learning cycles was developed by March & Olsen (1976: 12ff, cf. also Hedberg 1981: 3 and Pautzke 1989: 127f) and is labelled the “complete cycle of choice” (see Figure 2.9).

The learning cycle, according to March & Olsen (1976: 13), is started by the fact that some organizational members perceive a discrepancy between their “models of the world” and their environment. They try to make it fit again by their “individual actions”. This individual behaviour becomes “organizational actions”, which are either only choices of actions or even outcomes of these actions. Organizational actions provoke “environmental responses”, in the form of environmental actions. These actions affect again the individuals’ perception and preferences: either the perceived discrepancies have been removed now or the learning cycle has to be run through again.

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Figure 2.9: The Organizational Learning Cycle by March & Olsen

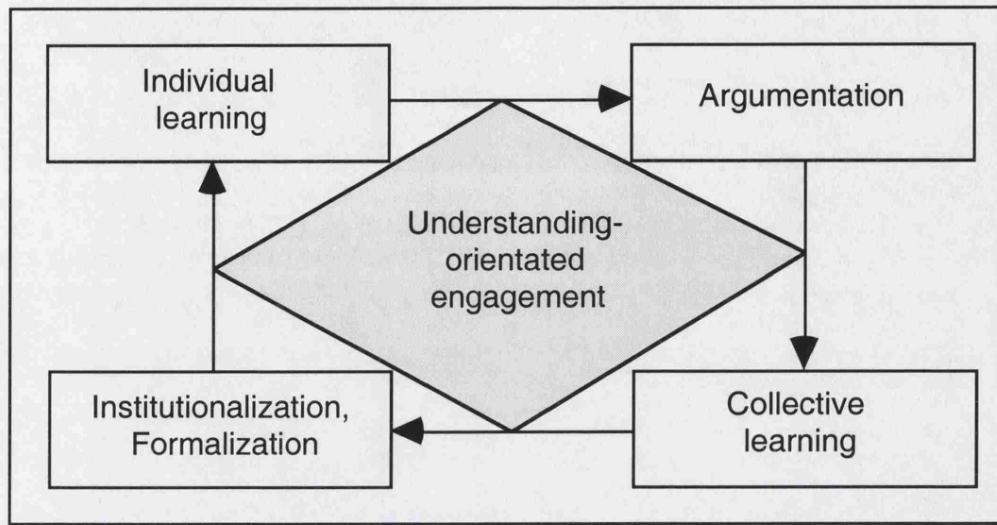


Source: March & Olsen 1976: 13.

Pautzke (1989: 128f) develops a further model for an organizational learning cycle (see Figure 2.10), which leads to collective learning. "Individual learning" conflicts in this model are solved through collective "argumentation". This leads to "collective learning" that has to undergo a process of "institutionalization" or "formalization". This again forms the frame for a further individual learning process.

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Figure 2.10: The Organizational Learning Cycle by Pautzke



Source: Pautzke 1989: 128, translated from German.

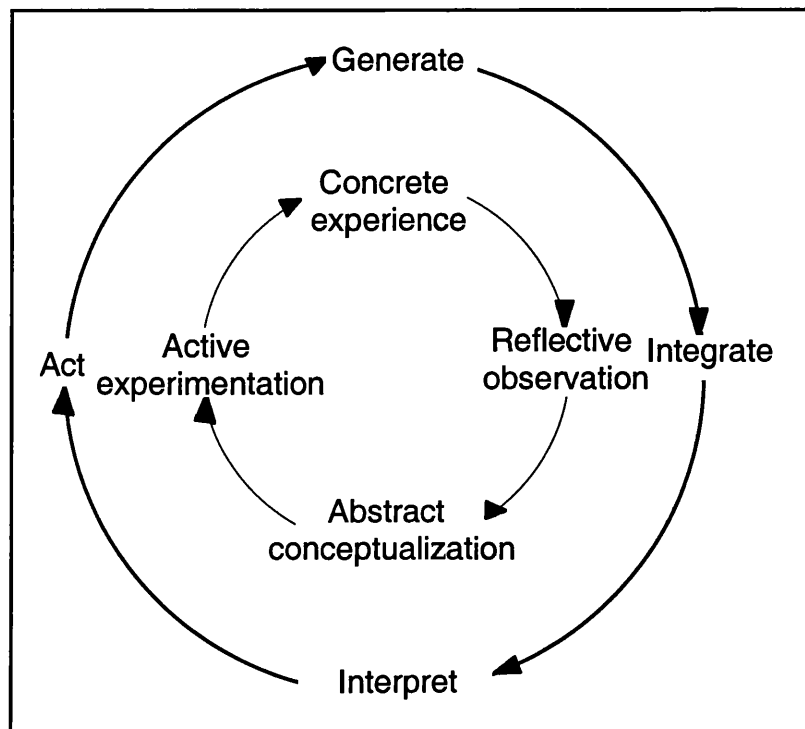
The organizational learning cycle by Dixon (1994) consists of four imperative steps, which are as follows (see Figure 2.11): (1) Generate information, (2) integrate this information into the organizational context, (3) interpret the information collectively and (4) act responsibly based on the interpreted meaning. Dixon (1994: 45f) also suggests that each member of the organization must be engaged in all steps of the experimental individual learning cycle by Kolb<sup>33</sup> (which is in the centre of the organizational learning cycle in Figure 2.11), in order to make the organizational learning cycle happen.

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<sup>33</sup> As shown above, Carlsson *et al.* 1995 transfer this experimental individual learning cycle from Kolb to an organizational learning cycle (cf., e.g., Kolb 1984).

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Figure 2.11: The Organizational Learning Cycle by Dixon



Source: Dixon 1994: 46.

In summary, the advanced organizational learning cycles described above consist of four different steps, which are all summarised in Table 2.5 below. Whereas March & Olson focus on the interaction of individual, organization and environment, Pautzke focuses here on the transfer from individual learning to collective learning, an area which lacks in Dixon's model as individual and organizational learning are two separate cycles.



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**Table 2.5:** Advanced Organizational Learning Cycles

<b>Author/s</b>	<b>Step I</b>	<b>Step II</b>	<b>Step III</b>	<b>Step IV</b>
March & Olson 1976	Individual beliefs	Individual action	Organizational action	Environmental response
Pautzke 1989	Individual learning	Argumentation	Collective Learning	Institutionaliz., Formalization
Dixon 1994	Generate	Integrate	Interpret	Act

However, these organizational learning cycles have in common that they do not include either team learning or organizational knowledge as important parts of organizational learning, the latter of which is the case for the cycles presented next.

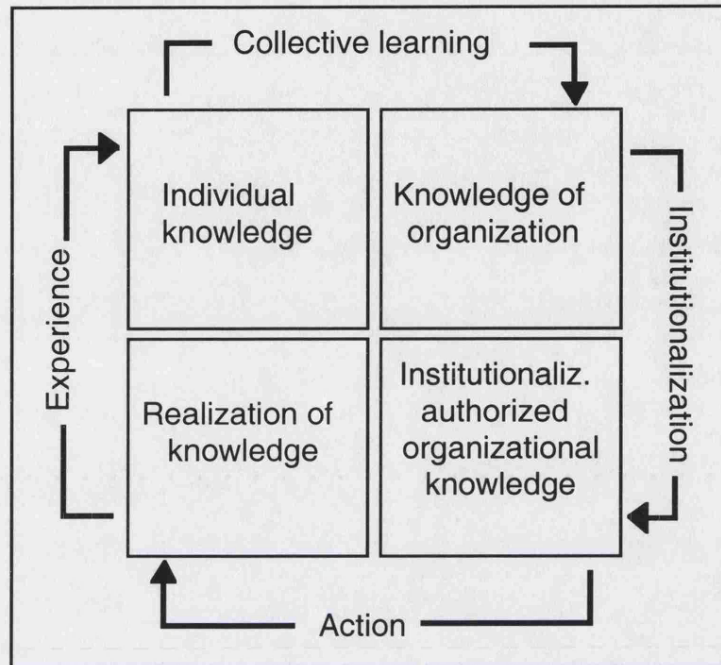
### 2.7.3. Advanced Organizational Learning Cycles with Memory

The third group is called “advanced organizational learning cycles with memory”, because, besides embracing individual and organizational learning and action, this group also includes organizational knowledge.

Müller-Strevens & Pautzke (1989: 141ff) present a model for an organizational learning cycle which contains elements of the steps of gaining knowledge (see Figure 2.12). The learning process is induced by an “action”, which leads to individual knowledge, based on individual “experience” or the sensing of differences in the environment. Through the process of “collective learning”, individual knowledge is transformed into organizational knowledge. In order to keep it available for the organization, it has to be transmitted into the organizational knowledge by “institutionalization”. This institutionalized, authorized knowledge of the organization again influences future action of its individuals.

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Figure 2.12: The Organizational Learning Cycle by Müller-Strevens & Pautzke



Source: Müller-Strevens & Pautzke 1989: 143, translated from German.

Müller-Strevens & Pautzke's model has a distinct weakness as neither experience can be gained in teams nor can learning happen individually.

The model of the organizational learning cycle developed by Nonaka & Takeuchi (1995: 56-94) is called the "Five phase model of the organizational knowledge-creation<sup>34</sup> process", and it is complex in its structure. The model is based on the spiral of organizational knowledge

<sup>34</sup> Despite the fact that Nonaka & Takeuchi (1995: 44ff) claim that organizational knowledge-creation is different to organizational learning, this is regarded as a tautology here, as the reasons given for the need of a distinction appear rather weak. However, it was shown in this chapter before that organizational knowledge is frequently mentioned in the different definitions of organizational learning (it is certainly a part of the definition of organizational learning of this thesis) and the opinions about organizational learning do not diverge much. It will also be shown in Chapter 3 that anticipation, and not adaptation, is a key element of the concept of the Learning Organization in the literature to date.

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creation, which uses two dimensions: the epistemological and the ontological dimension.

The *epistemological dimension* has the distinction between tacit and explicit knowledge as its key feature (cf. also Chapter 6) and includes the shifts between different modes of knowledge conversion. This starts with the mode of (1) socialization (field building), continues with (2) externalization (dialogue or collective reflection), then (3) combination (linking explicit knowledge) and ends with (4) internalization (learning by doing), where the cycle can be re-entered.

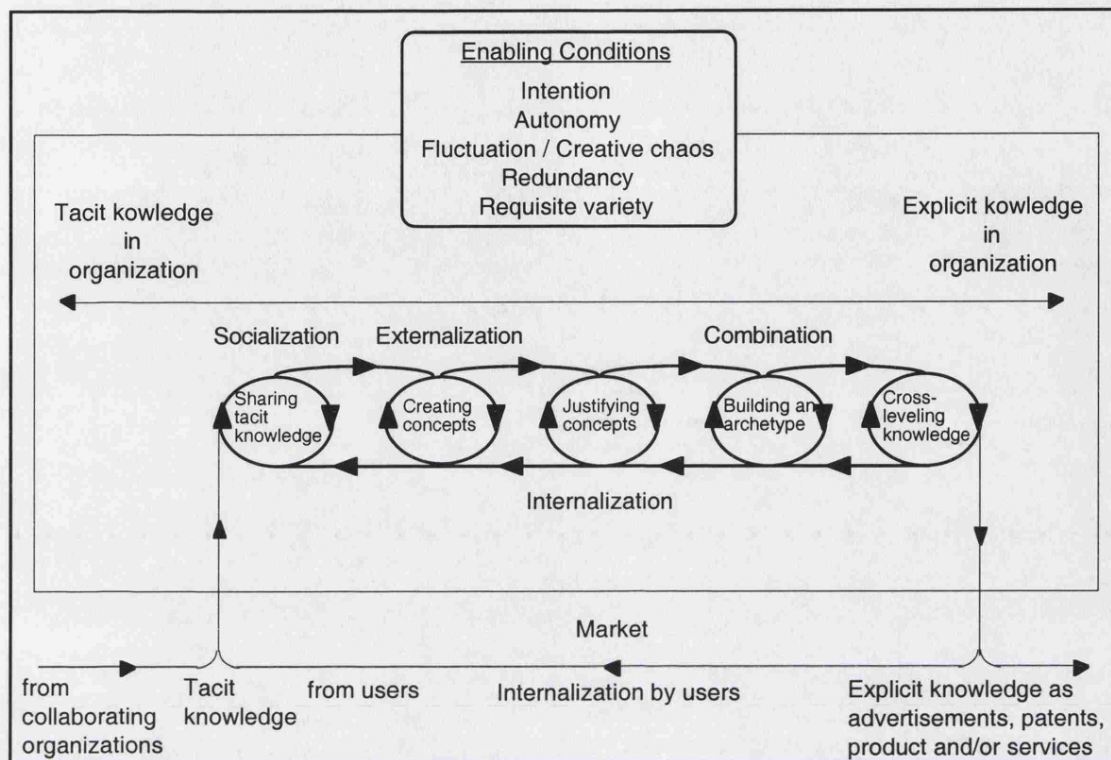
The *ontological dimension* means the different levels which the knowledge creation runs through, i.e. from the individual to the group to the organization, and even inter-organizational (which, however, can also be seen as a new individual level).

The epistemological and ontological dimensions are combined with five enabling conditions (intention, autonomy, fluctuation and creative chaos, redundancy, requisite variety, i.e. the internal diversity of an organization), in order to create the “Five phase model of the organizational knowledge-creation process” (see Figure 2.13).

This starts with (1) sharing of tacit knowledge by the individuals in the development team (socialization), goes on to (2) creating concepts by converting tacit into explicit knowledge (externalization), which has to be defended by (3) justifying concepts in an explicit way, then there is a focus on (4) building an archetype (combination) which includes prototyping, finishes by (5) cross-levelling (transfer) of knowledge gained in this learning process of one unit all over rest of the organization. This cycle can be run through again (internalization), starting from any of these five stages, as Nonaka & Takeuchi show in later examples.

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**Figure 2.13:** The Organizational Learning Cycle by Nonaka & Takeuchi



Source: Nonaka & Takeuchi 1995: 84.

Despite their useful distinction between tacit and explicit knowledge (see also Chapter 2.2), Nonaka & Takeuchi only focus on organizational double-loop learning in the form of new product development teams. This limits their model as it does not explicitly include individual learning as well as single-loop learning, and it also makes externalization a precondition, which might be sufficient but not necessary in order to learn organizationally. As such the creation of organizational knowledge by improving existing products is omitted, which is surely more a strength of Japanese companies on the whole than the development of completely new products.

Additionally, Nonaka & Takeuchi do not include an evaluation of the interruptions of their model, which happened even in the exemplary companies described by them. This is done by the model presented next.

Kim (1993: 43-49 and 1993a: 52-78) claims that his model of an organizational learning cycle is the first model of organizational learning,



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which comprises the transfer from individual to organizational learning, as well as the organizational knowledge base. This is not true as the models of March & Olson (1976) and Pautzke (1989) comprise the transfer function, and the model of Müller-Strevens & Pautzke (1989) comprises, besides the transfer function, the existence of organizational knowledge. Whereas Pautzke and Müller-Strevens & Pautzke were written in German and, therefore, not easily accessible to Kim, the model of March & Olson is explicitly described in Kim's work.

Kim's "integrated model of organizational learning" (1993: 43-49 and 1993a: 52-78) is a combination of Kofman's "observe-assess-design-implement individual cycle of learning" (based on his unpublished lecture slides at the MIT from 1992), Draft & Weick's model of "relationship among organizational scanning, interpretation and learning" and Argyris & Schön's "mental models", as well as individual and organizational "single-loop and double-loop learning" loops.

The actions of the individual learning cycle are divided by Kim (1993: 38ff and 1993a: 52-57) into two groups, and linked to framework and routines (see upper left side of Figure 2.14). The first group is described as "conceptual individual learning" (know-why), which consists of *assess* and *design* and is influenced by frameworks of individual mental models. The second group "operational individual learning" (know-how), which consists of *implement* and *observe* is influenced by the individual mental models of routines. "Mental models" are defined as "represent[ing] a person's view of the world, both explicit and implicit understanding." (Kim 1993: 39 and 1993a: 53).

In an individual double-loop learning process it is also possible that individual learning influences individual mental models. As there are many individuals in an organization the figure shows staples of individual learning cycles and individual mental models. Shared mental models are a combination of "Weltanschauung", which is the organizational view of the world, and "organizational routines".

The so-called "missing link" between individual and organizational learning is constructed by Kim (1993: 42-46 and 1993a: 67-74) through the process that individual mental models influence the shared mental models, and vice versa. However, the link between individual and organizational learning is not missing in the literature, it is only labelled differently, for



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example, being termed “dialogue”<sup>35</sup>. Thus, it is doubtful whether Kim’s claim of a new contribution to scientific knowledge is justified here.

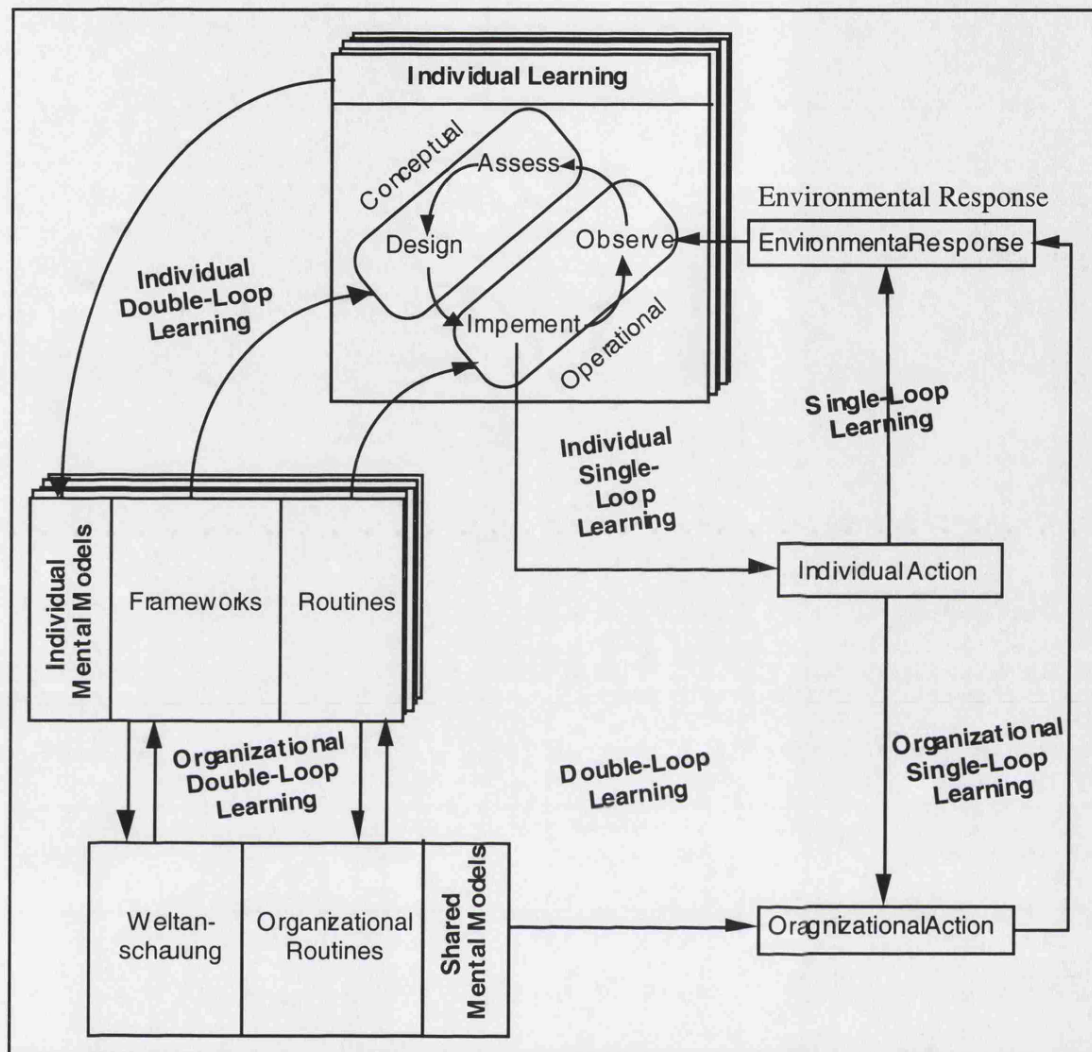
It is further argued that team or group learning plays an important role for the process of organizational learning, which can, for example, happen in the form of a dialogue. This is neglected by Kim (1993a: 70), who admits that he is not directly and explicitly dealing with groups and group effects in his model. He further proposes to take group as a “mini organization” or as “extended individuals”, which appears to add to the confusion rather than elicit his position.

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<sup>35</sup> Cf. Senge (1990 and 1990a), Isaacs (1993), Kofman & Senge (1993), Luthans *et al.* (1993), McGill & Slocum (1993), Schein (1993) and Ulrich *et al.* (1993).

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Figure 2.14: The Organizational Learning Cycle by Kim



Source: Kim 1993: 44 and 1993a: 69.

Kim (1993: 46f and 1993a: 75-78) also presents incomplete learning cycles, which means that the links are interrupted. These incomplete learning cycles are as follows: (1) Role-constrained Learning, (2) Audience Learning, (3) Superstitious Learning and (4) Learning under Ambiguity. The first four incomplete learning cycles are from March & Olson (1976: 56-59). Kim adds (5) Situational Learning, (6) Fragmented Learning and (7) Opportunistic Learning.

(1): *Role-constrained learning* means that individual beliefs do not affect individual actions.

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(2): *Audience learning* happens when organizational action is not affected by individual action in an unambiguous way.

(3): *Superstitious Learning* derives from severed connections between organizational actions and environmental response.

(4): *Learning under ambiguity* means that the causal connections between individual learning and action, organizational action and environmental response are not clear to the individual.

Kim adds the following three possible interruptions of learning cycles:

(5): *Situational Learning* deals with the problem that an individual either forgets, or does not classify its learning for later use. That means the link between individual learning and individual mental models is cut off. And since the individual mental models did not change, the shared mental model cannot alter either.

In this thesis it is argued that it is not only a negative thing to forget, or to forget to codify, knowledge of problem solving. It can also be an important way to prevent individuals from being overloaded by information and, thereby, sheltering the organization from information overload. However, the organizational culture must give some basic guidelines as to what kind of information is unimportant and, thus, can be "forgotten".

(6): *Fragmented Learning* deals with a situation wherein the individuals learn but the organization does not learn, i.e. the link between individual mental models and shared mental models is severed. Thus, organizational learning is fragmented among isolated individuals or groups, and cannot be retrieved from the organizational memory, especially if these individuals or groups have left the organization.

It is proposed here that fragmented learning can also be a very useful tool, if an organization wants to try out new ways of reacting to the environment. If the project of fragmented learning fails, the damage can be minimised. However, it is admitted that there can be severe problems of knowledge transfer, when the project turns out to be successful. Again, the



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organizational culture and structure will be very influential on whether new superior knowledge is adopted or not.<sup>36</sup>

(7): *Opportunistic Learning* takes place when individual action or small group action influences organizational action, which does not comply with the commonly-shared mental models of the organization. Two examples are given for opportunistic learning by Kim. Firstly, IBM's fast development of its first Personal Computer, which was performed by a separate project team, independent of the bureaucratic organization. Secondly, GM's creation of the Saturn car project<sup>37</sup> is also an example of opportunistic learning.

In this thesis it is argued that these two examples might be regarded as successful opportunistic learning. However, both organizations did not manage to transfer the new insights gained to the whole organization, due to fragmented learning.

Despite some interesting insights, Kim's model for an organizational learning cycle appears to be quite complicated, lacks team learning and is not easy to follow visually.

In summary, the sub-sections so far discussed the different forms of organizational learning cycles in listing literature to date. This thesis presents an approach for an organizational learning cycle in the next sub-section, which is not too complex, but comprises all the important elements needed: the comprehensive organizational learning cycle.

<sup>36</sup> For example, it took GM nearly 10 years before it decided to apply the new knowledge learnt in NUMMI and CAMI, and to build the Eisenach plant in Germany (cf. Ingrassia & White 1994).

<sup>37</sup> There are various experts of the car industry (e.g., members of the International Motor Vehicle Program) who would not judge the Saturn project to be a success, because of the extensive development time, combined with many delays and high development investments. The NUMMI project, a joint-venture with Toyota in California, can be seen as a success for General Motors in terms of operations, however, to a less extend in terms of organizational learning, which was slow (cf. also Ingrassia & White 1994).

## 2. ORGANIZATIONAL LEARNING

### 2.7.4. Model of the Comprehensive Organizational Learning Cycle

As shown in the previous sub-sections, organizational learning cycles can be very complex, and can be defined very differently. The organizational learning cycles from the previous sub-sections included, besides individual and organizational learning, organizational knowledge.

The working model of the comprehensive organizational learning cycle of this thesis also includes team learning, which has not been done previously, and the importance of which has already been pointed out in the definition of organizational learning. Individual, team and organizational learning can take place at a single-loop, double-loop or deuterio-learning level. This is indicated by the circles around each learning level and is integrated into a plain model of the comprehensive organizational learning cycle (see Figure 2.15).

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you  
key  
N+T!

This model of the comprehensive organizational learning cycle is performed with continuous support of *organizational knowledge*.

Firstly, *individual learning* is performed, and the lessons learnt are *codified* and, thereby, made accessible to other individuals of a team (or optional to the whole organization, as indicated with the thin arrow to “organizational learning”).

how?

Secondly, *team learning* is accomplished<sup>38</sup>. This has been neglected by the organizational learning cycle models introduced so far<sup>39</sup>, and followed by a *generalization* of this knowledge, which is accessible to the whole organization.

Thirdly, *organizational learning* is conducted, the knowledge is *institutionalized*, and the organizational learning cycle is completed by leading to individual learning again. The “organizational knowledge” is now available to all individuals of the organization, which then have a revised framework for further individual learning.

All these three different types of learning can vary in their intensity, and, therefore, be on a single-loop, double-loop or deuterio-learning level.

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<sup>38</sup> Obviously, team learning includes individuals, however, at least two individuals together.

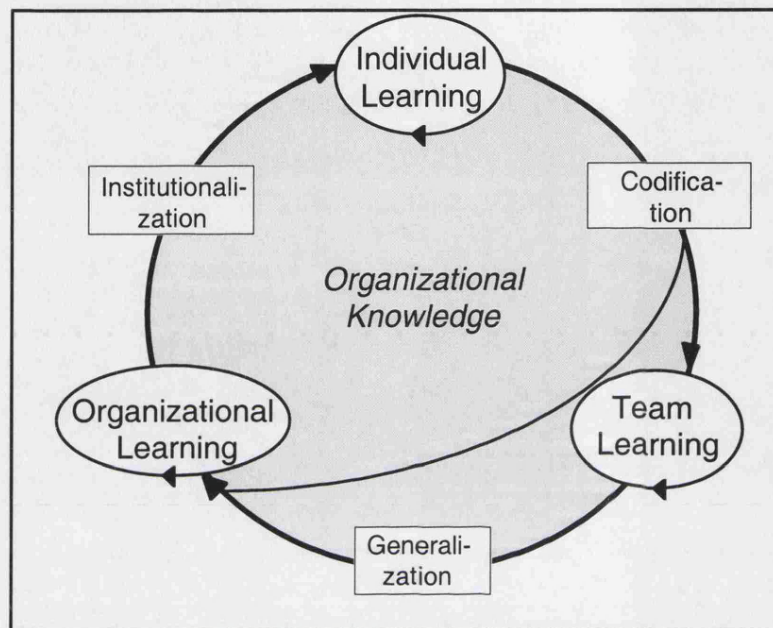
<sup>39</sup> Some authors like Senge (1990) generally emphasize the importance of team learning for organizational learning, however, not within the context of an organizational learning cycle model.



## 2. ORGANIZATIONAL LEARNING

All the distinction made here are not that clear cut in practice as the model might suggest, however, the model reduces the complexity and helps to understand the reality better, making it easier to deal with it successfully.

Figure 2.15: The Comprehensive Organizational Learning Cycle



Although there is a way of direct transfer from *codification* to *organizational learning* in this comprehensive model, by-passing team learning, it is argued here that this predominantly applies to non-complex explicit knowledge (this is the reason for drawing only a thin arrow). As a consequence, this plain model of the comprehensive organizational learning cycle can cope not only with the vast amount of complex knowledge, but also with tacit knowledge, which could hardly be transferred without team learning. Because it facilitates socialization, and does not need externalization, which can be very resource demanding, sometimes even impossible, due to the nature of tacit knowledge.

*but tacit knowledge can be transferred through socialization*

Unlike the model of Nonaka & Takeuchi (1995), which comprises knowledge creation by externalization of tacit knowledge, this plain model of the comprehensive organizational learning cycle includes not only knowledge creation of new knowledge, but also acquisition of existing

The team builds a complete system and then throws in everything but all at the same level

## 2. ORGANIZATIONAL LEARNING

knowledge; and not only externalization, but also other forms of knowledge conversions (i.e. internalization, socialization and combination).

It is important to be aware of the importance of the three types of learning - i.e. individual, team and organizational learning. They all need to be supported by incentives, and learning barriers have to be removed in order to establish an organization that can excel in learning.

However, there are still many possibilities for incomplete organizational learning, also within this model of the comprehensive organizational learning cycle (see Figure 2.16).

There can be a break between **(1) individual learning and codification**. This means that an individual is not capable, forgot or has no incentives to codify newly-acquired knowledge. This is like Kim's "situational learning" introduced above, when individual mental models fail to be created from individual learning.

The next possibility of a cut off is between **(2) codification and team learning**, which can be seen as a new contribution to the literature on organizational learning. It implies that codified individual knowledge is not made accessible to teams, who might be interested in this knowledge. The reasons for this can be missing incentives in an organization culture or a structure, which prevent the individual from passing on valuable information (e.g., a competitive organizational culture). Another reason could be forgetting or a judgement that the knowledge not important enough to be passed on. These effects can be positive, because of efficiency gains, if the standards for judgement are commonly agreed upon within the organization.

The situation of an interruption between codification and team learning is similar to the one between **(2) codification and organizational learning**. The major difference lies in the fact that the codification has more the nature of a generalization, including the problem of potential conflicts of the codified knowledge with the dominant organizational culture.

The third interruption can happen between **(3) team learning and generalization**. Here, the new knowledge of the team cannot be generalized, in order to be accessible to the whole organization. Reasons for this can be missing skills and training to do so, organizational values and structure that give no incentive for generalization or that the team



why only why must be create his  
own version here?

## 2. ORGANIZATIONAL LEARNING

simply forgets the lessons learnt. Alternatively, it can happen when teams do not feel inclined to give away their important knowledge to other teams, which may even be competitors within the organization. This can be caused by a competitive organizational culture and/or structure.

The fourth break between **(4) generalization and organizational learning** can occur, for example, when the organization is not willing to take up the generalization of team learning, because it conflicts with the dominating organizational culture or the team which generalized the knowledge has not a high standing within the organization. Also, the rest of the organization might not be convinced of the necessity of learning new knowledge, as the performance appears to be sufficient enough. Lastly, there might also no resources available to teach and learn the new knowledge.

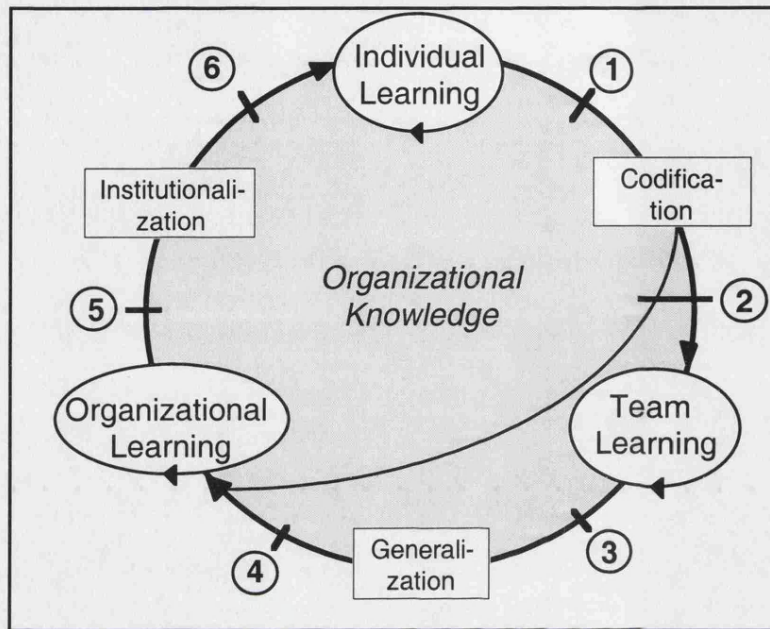
The learning cycle can be also severed between **(5) organizational learning and institutionalization**, which means that generalized knowledge is not stored in some kind of organizational memory, particularly in implicit (tacit) memory forms, as described in this chapter before. This can be understood as the organization learnt something new, but failed to incorporate what it had learnt in some type of memory store, due to various reasons, such as lack of experience, resources or systems to do so.

This break is similar to “fragmented learning” in Kim’s model mentioned above, where the individual mental models are not transferred to organizational mental models. However, fragmented learning includes less detail as though it comprises all steps from codification, it leaves out team learning and generalization.

The last interruption can happen between **(6) institutionalization and individual learning**. Here the organizational memory has for some reasons no effect on individual learning. This can occur when the individual is new within the organization, and has had no time to acquire institutionalized organizational knowledge. Or the individual does not know how to retrieve organizational knowledge, as it has not been sufficiently publicised. It can also take place when long-serving individuals do not accept newly-acquired institutionalized knowledge.

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**Figure 2.16:** The Comprehensive Organizational Learning Cycle with Possible Interruptions (1 to 6) in the Learning Process



In summary, this section developed a working model of the comprehensive organizational learning cycle, which also added the team learning element. Individual, team and organizational learning all flow, with mutual impact, around organizational memory. These different types of learning can be on a single-loop, double-loop or deuterio-learning level. It was also shown that this organizational learning cycle can often be incomplete in reality and, therefore, limiting organizational learning. This will be researched in practice in detail in Chapter 9.

The next chapter develops a model of an organization that excels in organizational learning, which is called the Learning Organization.

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 "comprehensive  
 learning cycle"  
 his own



### 3. The Learning Organization as an Ideal

Some authors, like Pearn *et al.* (1995), suggest that all organizations are “learning organizations”, as every organization could learn by chance. In this thesis, however, the **Learning Organization** is spelt with a capital “L” and “O” and refers to the ideal model of an organization which excels in organizational learning, as defined at the end of Chapter 2.1. Therefore, the Learning Organization is the adequate answer to a fast changing environment (cf. also Senge 1990a: 7 or Garvin 1993: 78).

Is it the same as goal?

This chapter explicitly deals with the Learning Organization and its characteristics. The latter have not been refined, structured and synthesised to date in such a comprehensive way, also depending on how conducive these characteristics are for organizational learning.

First, different theories of organizations are presented and discussed. Then, various definitions of Learning Organizations are analysed and a working definition is developed. Afterwards, the ten characteristics of the Learning Organization are constructed from the examination of nearly thirty different pieces of literature about the Learning Organization. The theoretical interdependencies and order of importance of the characteristics of the Learning Organization are discussed in the end.

#### 3.1. Perceptions of the Organization

There are various different perceptions of an organization, but this work will focus on those images which were most important for the evolutionary development of the model of the Learning Organization.<sup>40</sup> These perceptions are: the organization as a machine, as an organism or as a learning entity, which will all three be introduced in this section.

##### 3.1.1. Perception of the Organization as a Machine

The classic management theory was predominantly driven by an engineering perspective. The concept was mechanistic and perceived the

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<sup>40</sup> For an introduction of further viewpoints of the organization as a social system, as a political system or as a culture, etc., see Morgan 1986.

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

organization as a machine. An organization was seen to be manageable with the help of analytical calculations and construction. The aim was to structure an organization optimally according to its working techniques, independent of the situation, as there was a deep belief in a one-best-way. Representatives of this school of thought were Gutenberg, Weber, Fayol and Taylor.

In this thesis the **“Bureaucratic-Tayloristic Organization”** is chosen for the image of an organization as a machine, as it is applicable to organizations with office as well as shop-floor employees. In addition, Weber’s bureaucracy and Taylorism appear to be the most important theories of perceiving an organization as a machine.

**“Bureaucratic”** refers to an office setting of white collar employees. This term was made popular by the German sociologist Max Weber, who propagated the Bureaucratic Organization as a superior form of organization. The reasons for the belief in its superiority as oppose to other forms of organizations were as follows (Weber 1947: 324-33, cf. also Bendix 1966: 423-30 and Gabler Wirtschafts-Lexikon 1988: 1031f):

- Orderly system of rules on basis of a statute
- Legal-rational authority
- Differentiation of positions and distribution of functions, responsibilities and authorisation
- Standardization of tasks
- Hierarchically structured non-personal order of positions
- Specialised training for staff
- Division of administration and ownership
- Written capturing of all actions in files

The perceived advantages of the bureaucracy, as opposed to other organizations in modern complex societies, are a high degree of labour division, differentiation, objectivity, continuity, ability to calculate, ability to plan and reliability.

**“Tayloristic”** refers to Taylorism, i.e. Scientific Management, which was developed in a blue-collar setting by Frederick W. Taylor and described in his book **“The Principles of Scientific Management”** in 1911. Scientific Management, which meant that engineers designed efficient work

still very second-hand - Land  
org. theory

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

processes by dividing normal work into its smallest perceivable units of action with the help of stop watches. Taylorism meant all in all (cf. Gabler Wirtschafts-Lexikon 1988: 1887f and Staehle 1990: 22f):

- Systematic time-and-motion studies
- Pay depends on work efficiency
- Division of planning and execution
- Scientific working methods and standardisation of tasks
- Control of work by management
- Functional organization

Both theories, Weber's Bureaucracy and Taylor's Scientific Management, which are combined to the Bureaucratic-Tayloristic Organization here, refer to the perception of the organization as a machine and assume that it only needs to be fine-tuned once it is established. Furthermore, employees, white-collars as well as blue collars, can easily be exchanged and they are more seen as a simple production factor than human beings with more complex personalities.

The problem with the Bureaucratic-Tayloristic Organization is that the organization is hard to overlook or grasp for its employees, as work is divided into small bits. This leads to uncomfortable feelings and lower participation, as causes and relationships cannot be assessed; and, therefore, employees do not feel able change anything (cf. also Gabler Wirtschafts-Lexikon 1988: 1887f). oh  
ocor

Although the Bureaucratic-Tayloristic Organization might be useful in stable environments, This strength turns out to be a weakness in an unstable environment, as it is a major difficulty to change the structure of the Bureaucratic-Tayloristic Organization in a short time, as this is not its main purpose. Change normally only happens when the higher levels of the organization's management perceive a crisis that is caused by a change in the environment; however, this can be too late. | poor

In order to overcome the disadvantage of the perception of a one-best-way, a different concept was developed, which focused on the metaphor of an organism that reacts more flexible to changes in the environment.

So that's 5  
to the celebration!



### 3. THE LEARNING ORGANIZATION AS AN IDEAL

#### 3.1.2. Perception of the Organization as an Organism

This concept of an organization as an organism was developed as a result of the criticism of the organization as a machine. Derived from biology, the organism concept comprises environmental conditions, specifically the relationship between the organization and its environment. The organization is determined by the environment and survival is the key (cf. Morgan 1986: 39-71, Klimecki *et al.* 1991: 112ff and Staehle 1991: 837-41).

Burns & Stalker's (1961) development of the organic system can be seen as one of the most important representatives of the model of an organism. They develop it as a counter model to the mechanistic system, after researching different industries. They argue that when "novelty and unfamiliarity in both market situation and technical information become the accepted order of things, a fundamentally different kind of management system becomes appropriate [i.e. organic system] from that which applies to a relatively stable commercial and technical environment." (Burns & Stalker 1961: XXI).

This model of an organization as an organism represents an important step in the direction of the organization as a learning system. However, it is argued here, that with its predominantly adaptive point of view (i.e., that the organization adapts to change), the model does not include the ability of an organization to anticipate change. It can also be the case that the structure of an organization alters its environment, which is not really considered by the image of an organization as an organism (cf. also Klimecki *et al.* 1991: 113).

#### 3.1.3. Perception of the Organization as a Learning Entity

Neither the image of an organization as a machine nor as an organism includes the capability to anticipate or change the environment. This was done with the development of the perception of an organization as a learning entity, which was derived from sociology.

The organization as a learning entity has the ability to reflect critically through its members and use past experience, in order to anticipate future events and prepare itself for them. Additionally, the organizations are seen



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as social systems, which secure their continuation through the generation of a meaning of life. Therefore, organizations are dissolved or reconstructed if they cannot generate meaning anymore, as they are only man-made artificial constructs (cf. Klimecki *et al.* 1991: 114-20 and Staehle 1991: 842-46).

It is argued here that the perception of organizations as learning entities helps to understand and identify the amplifier for, and the impediments against, organizational effectiveness and efficiency. The framework of the Learning Organization is a useful tool to analyse and improve capabilities of existing organizations to learn, in order to increase the efficiency and effectiveness of their actions, including the capability to anticipate changes or change the environment according to their needs.

hardly  
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possible

#### 3.1.4. Perception of the Machine vs. the Learning Entity

This section deals with the differences between the Bureaucratic-Tayloristic Organization, as explained at the beginning of this chapter, and the Learning Organization<sup>41</sup>. Although both might not be a perfect picture of reality, these two archetypes help to decipher organizational structure and their purpose.

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An example is provided to demonstrate the different purposes of Bureaucratic-Tayloristic Organizations and Learning Organizations.<sup>42</sup>

Firstly, take a Bureaucratic-Tayloristic Organization and let all its members leave. It will be possible to continue to work with new staff after a short while. This is because most of the work in Bureaucratic-Tayloristic

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<sup>41</sup> In order to avoid any misinterpretation, it might be added at this point that "high involvement organizations", "high commitment organizations", or "fun organizations" do not judge an organization on the basis of its learning and, therefore, can be classified as Learning Organizations as well as Bureaucratic-Tayloristic Organizations.

huh?

<sup>42</sup> This example has got a different outcome from the scenario given by Kim (1993: 44f and 1993a: 71ff), who claims that it is always easier for all kinds of organizations to survive a loss of all files than a loss of all members. The main reason for this is that Kim claims that even in very bureaucratic organizations the main essence of the organization is embodied in the people and not in the system. This is an argument that cannot be ascribed to bureaucratic organizations (Bureaucratic-Tayloristic Organizations) here, because one of their main intentions is to be independent of key people.

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Organization is based on the principle "*Quod non est in actis, non est in mundo*."<sup>43</sup>, which means that all proceedings are to be noted in files and jobs to be clearly structured. However, when a Bureaucratic-Tayloristic Organization is confronted with a loss of site including its files, the employees are expected to have a very hard time in trying to make the organization work again.

Secondly, take a Learning Organization and let it relocate to a different site without files, but with all current staff. The reaction will be that the Learning Organization will be able to continue to work, because it is people-oriented and does not rely on files to such a great extent. However, if current organizational members are replaced by new staff at the old site, this can be a catastrophe for the Learning Organization, as knowledge is centred on people rather than on media.

Thus, for Learning Organizations implicit knowledge tends to be more important because they are more people driven, whereas Bureaucratic-Tayloristic Organizations are more dependent on explicit organizational knowledge.

In brief, the ideal of the Bureaucratic-Tayloristic Organization is the adequate answer to stable environments, whereas the ideal of the Learning Organization is an adequate answer to fast changing environments, because it excels in the capability of organizational learning. Thus, the question arises whether environments are going to be more and less stable in the future. In particular, how does the situation look in the automotive supplier industry in the UK, being the focus of this empirical research?

The European Union (EU) negotiated a "voluntarily agreed limit" between the EU and Japan in 1991, in order to protect the car industry in Western Europe from Japanese car imports. This led to vast direct investment by Japanese car producers and some of their suppliers in Europe, especially in Britain. In 1999, the old agreement runs out and the free market rules of the GATT (General Agreement on Tariffs and Trade) apply to the European car market (FAZ 2-4-1997, FT 14-7-1992, FT (5)

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<sup>43</sup> This can be translated with: What is not laid down in files does not exist. It is a quote of a civil servant of the German Ministry of Foreign Affairs. He further gave the example of newly joining an embassy, where none of the top civil servants were available for different reasons. However, he could quickly take up all major tasks, because there were files about them.



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28-6-1993, FT (9) 28-6-1993 and Wolters 1994: 22). All these factors accelerate change in the Western European car industry, including car component suppliers, especially in Britain - an area this thesis will focus its investigation on in more depth.

In summary, the Learning Organization is the adequate organizational structure for a fast changing environment, which is especially due to its capability to anticipate change. However, one should keep in mind that the Learning Organization, as well as the Bureaucratic-Tayloristic Organization, are both ideal types of organizations and will rarely be found in this purity in reality.

The next section will take a closer look at definitions of the Learning Organization, as they are given in the literature.

#### 3.2. Definitions of the Learning Organization

This section presents and discusses some definitions of the Learning Organizations in literature. Thereafter, a working definition for this thesis is developed as a synthesis.

According to Senge (1990: 3)

“[Learning Organizations] are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.”

The definition of the learning company by Pedler *et al.* (1991: 1)<sup>44</sup> is quite similar to the one for the Learning Organization of Burgoyne (1992: 323):

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<sup>44</sup> “A Learning Company is an organization that facilitates the learning of all its members and continuously transforms itself.” Pedler *et al.* (1991: 1) state in their book that they preferred the term learning company to learning organizations, because they thought it to be more convenient to practitioners for whom their book was intended.

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

“a learning organization continuously transforms itself in the process reciprocally linked to the development of all its members.”

This definition is not very precise and, thus, hard to operationalize, which would be needed to be of use for this thesis's empirical work.

Garvin (1993: 80) presents the following definition of the Learning Organization, after reviewing various definitions of organizational learning. This is inaccurate as organizational learning is not the same as the Learning Organization, as the former is a process, whereas the latter is a system. Therefore, his definition is very process oriented:

“A learning organization is an organization skilled at creating, acquiring and transferring knowledge and at modifying its behaviour to reflect new knowledge and insights.”

Thurbin (1994: 7) suggests a definition, which is easy to understand for practitioners, and appears more operationalizable than the previous definitions. It focuses on individuals as learning agents:

“A learning organization is one which improves its knowledge and understanding of itself and its environment over time, by facilitating and making use of the learning of its individual members.”

These definitions show that the authors have an ideal of the Learning Organization in mind, which is not just an organization that learns. Developing a working definition for this thesis, it is suggested that only those organizations are labelled Learning Organizations, which show a high performance in organizational learning. This could be phrased as: *The Learning Organization is an organization which excels in organizational learning.*

The reason for this high performance in organizational learning, including its agents, is dealt with the next part of the definition: *This is because this organization possesses a high degree of certain characteristics that foster the process of acquisition or generation of organizational knowledge through its members.*



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And the results of this organizational learning are dealt by: *which is intentionally used for the continuous improvement of organizational actions and its outcomes.*

In summary, following working definition of the Learning Organization is proposed for this thesis:

The **Learning Organization** is an organization which excels in organizational learning and outcomes. This is because this organization possesses a high degree of certain characteristics that foster the process of acquisition or generation of organizational knowledge through its members, which is intentionally used for the continuous improvement of organizational actions and its outcomes.

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There is no consensus in the literature on Learning Organizations as to what exactly these characteristics of the Learning Organization are. The next section develops a synopsis of the characteristics mentioned by the literature to date.

#### 3.3. The Ten Characteristics of the Learning Organization<sup>45</sup>

The methodological development of the **ten characteristics of the Learning Organization** of this thesis started with Senge's *five disciplines*. Senge (1990: 5) argues that what "fundamentally will distinguish learning organizations from traditional authoritarian 'controlling organizations'<sup>46</sup> will be the mastery of certain basic disciplines. That is why the 'disciplines of the learning organization' are vital."

Senge (1990) names five different critical disciplines, as a set for the Learning Organization. They are as follows:

(1) **Systems thinking** refers to a certain conceptual framework, which makes the pattern of the events clear, and enables to change those

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<sup>45</sup> Cf. also parts of Rosengarten (1993: 29-36), but especially the ECLO (European Consortium of the Learning Organization) Conference Paper (Rosengarten 1995: 231-52) and the LILO (Learning Individual Learning Organization) Meeting Paper (Rosengarten 1996a: 1-15).

<sup>46</sup> In this thesis, Senge's "traditional authoritarian controlling organization" is called "Bureaucratic-Tayloristic Organization"; it is compared to the Learning Organization at the end of Chapter 3.1.

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

patterns if needed. (2) **Personal mastery** refers to a certain standard of proficiency in terms of continuous clarification and intensification of the personal vision of what really matters in life. This is applicable to each member of the whole organization. (3) **Mental models** are the world-views which impact people in their understanding of the world and how they act; and these have to be made explicit to be analysed and exchanged. (4) **Building shared vision** is the key for gaining commitment of all members of the organization, in order to make them excel and learn by themselves. (5) **Team learning**, last but not least, is suggested by Senge to be the fundamental learning unit of the Learning Organization. This implies not only communication, but also communal thinking.

Senge's *five disciplines* are taken into account when some of the *ten characteristics of the Learning Organization* are developed in this thesis; but these are not necessarily exactly the same like the disciplines, due to suggestions by other authors as well as further analysis and evaluation.

*Systems thinking* alone, for example, would limit the potential breadth of this characteristic, as the former is a specific tool of "systemic thinking". In fact, this characteristic systemic thinking is not necessarily limited to one tool and could also be described as the thinking of "a wise old man", which takes interacting variables of a decision into account. *Personal mastery*, in the context of developing the characteristics of the Learning Organization, is seen as the ability to generate and pursue a supportive organizational learning culture, which fosters dialogue, personal interpretation of reality and personal vision of the future as well as openness and commitment. These enable the creation of shared *mental models* and *shared visions*, which are regarded as a shared interpretation of reality and shared vision of the future. They are subsumed as parts of the "supportive corporate learning culture" here. With respect to *team learning*, as opposed to Senge's suggestion (1990: 10) that "unless teams can learn, the organization cannot learn"<sup>47</sup>, it is shown in this thesis that an organization, particularly the Learning Organization, can also learn through individual learning alone.

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<sup>47</sup> Admittedly, Senge (1990: 139) later also suggests in his book: "Organizations learn only through individuals who learn. Individual learning does not guarantee organizational learning. But without it no organizational learning occurs." Still, this does not contradict the statement referred to in the text.



### 3. THE LEARNING ORGANIZATION AS AN IDEAL

Scanning the literature on Learning Organizations, one can find similar, but also further, suggestions for the characteristics of the Learning Organization that are conducive to organizational learning, and, therefore, organizational learning outcomes. These various characteristics of the Learning Organization are analysed and transformed into a list, which is presented here. Then their interrelationship is discussed and an initial ranking according to their importance for organizational learning is suggested.

This thesis' contribution is that these characteristics of the Learning Organization have not been refined, structured and synthesised to date in such a comprehensive way, also according to how conducive they are for organizational learning. This becomes clear in an overview of how these characteristics' appear in literature (see Table 3.1), where only maximal seven out of the ten are mentioned in one single source and this only in two out of twenty eight cases. In addition, many models in existing literature seem to be piecemeal and sometimes diffuse in their structure.

These ten characteristics of the Learning Organization<sup>48</sup>, crucial to excel in organizational learning and its outcomes, are as follows:

- *Team work and team learning*, in order to facilitate organizational learning in cross-functional and/or cross-hierarchical project work.
- *Systemic thinking and mental models* to (re)structure an organization according to its current and future organizational learning requirements.
- *Free vertical and horizontal flow of information* to enable a continuous information exchange, needed for organizational learning.
- *Education and training of the whole workforce*, in order to ensure that organizational learning can take place in the most efficient way.
- *Learning reward system for employees*, in order to keep organizational learning going in a self-perpetuated systematic process.
- *Continuous improvement of work*, in order to ensure steady organizational learning regarding efficiency and effectiveness of tasks.

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<sup>48</sup> This order does not indicate any specific ranking, this will be done later in this chapter.

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

- *Flexibility of company strategy and employees*, in order to provide enough flexibility and variety for organizational learning.
- *Decentralized hierarchies and participative management*, in order to guarantee speed of organizational learning and its implementation.
- *Learning laboratories and constant experimentation*, in order to enable organizational “learning by doing” while limiting the potential risk.
- *Supportive corporate learning culture*, in order to facilitate and foster organizational learning by a clear set of assisting values and goals.

Each of these elements of the Learning Organization will be discussed in more detail below, including the corresponding sources in literature.

But first, in order to gain a better overview of the characteristics of the Learning Organization, a list of authors and their works about Learning Organizations, most of them quoted in the last section, is given in Table 3.1. Characteristics of the Learning Organization which have been covered by authors are marked with an “X”.



### 3. THE LEARNING ORGANIZATION AS AN IDEAL

**Table 3.1: Available Literature Covering the Characteristics of the Learning Organization**

Author(s)	Year	1	2	3	4	5	6	7	8	9	10	10.1	10.2	10.3	10.4	10.5	10.6
Argyris & Schön	1978	X	X								X	X	X	X	X		X
Hedberg	1981		X						X	X							
Shrivastava	1983	X		X	X				X						X		
Fiol & Lyles	1985							X	X		X						
Puick	1988				X												
Pautzke	1989													X			
Stata	1989	X	X	X										X	X		
Senge	1990	X	X							X	X	X	X	X	X	X	
Senge	1990a		X						X			X	X		X		
Sirkin & Stalk	1990	X				X											
Klimecki <i>et al.</i>	1991			X				X	X					X	X	X	X
Leonard-Barton	1992	X	X	X	X	X	X			X					X		X
McGill <i>et al.</i>	1992	X	X			X		X			X				X		X
Nonaka	1992						X	X								X	
Pawlowsky	1992											X				X	
Probst	1992			X						X						X	X
Sonnenberg & G.	1992	X														X	
Adler	1993						X										
Adler & Cole	1993						X										
Garvin	1993			X	X	X	X	X		X						X	
Isaacs	1993			X								X					
Kim	1993		X							X			X	X			
Kofman & Senge	1993		X							X		X				X	
McGill & Slocum	1993		X	X		X	X	X		X	X	X			X	X	X
Schein	1993a		X	X								X					X
Ulrich <i>et al.</i>	1993			X	X	X	X			X	X	X				X	X
Luthans <i>et al.</i>	1994		X	X	X			X				X	X				
Nevis <i>et al.</i>	1995		X		X		X	X		X			X	X	X		X

**Explanation of numbers on the top:**

- 1 = Team work and team learning
- 2 = Systemic thinking and mental models
- 3 = Free vertical and horizontal flow of information
- 4 = Education and training of the whole workforce
- 5 = Learning reward system for employees
- 6 = Continuous improvement of work
- 7 = Flexibility of company strategy and employees
- 8 = Decentralized hierarchies and participative management
- 9 = Learning laboratories and constant experimentation
- 10 = Supportive corporate learning culture:
- 10.1 = Dialogue, 10.2 = Shared interpretation of reality, 10.3 = Shared vision of the future,
- 10.4 = Openness & trust, 10.5 = Commitment & tolerance, 10.6 = Risk taking & responsibility

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#### 3.3.1. Team Work and Team Learning

Team work and team learning is necessary for facilitating organizational learning in cross-functional and cross-hierarchical project work inside the organization or between different organizations. This is because it is not dependent on official hierarchical ways, which slow down the organizational learning process and often filter vital information needed for the project.

“Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations”, Senge (1990: 10) points out. The great importance of teams (or groups) in an organization is often stressed as being the key element of the Learning Organization, whether in short-term problem task forces or in long-term project teams.

Team work and team learning are vital elements for the Learning Organization, because organizational learning, i.e. the gathering or creating, processing and dissemination of knowledge, is done by co-operating work groups (cf. Shrivastava 1983: 22).

These teams can be mixed horizontally as well as vertically (McGill *et al.* 1992: 12 and Sirkin & Stalk 1990: 28). Even mixed teams, consisting of suppliers, customers or competitors are common practice for Learning Organizations (Leonard-Barton 1992: 35 and Sirkin & Stalk 1990: 28).

Are teams autonomous or not? Do they have team leaders? If yes, how are they chosen? And are teams in the Learning Organization formal or more informal, and what impact does the degree of formalization have on the effectiveness of a team? Additionally, do intra-organizational or inter-organizational teams play a more important role for organizational learning?

#### 3.3.2. Systemic Thinking and Mental Models

Systemic thinking and mental models are the basis for the process of structuring and restructuring the Learning Organization according to its current and future organizational learning requirements.

Systemic thinking is an essential tool to make individual and organizational learning much more simple. The whole organization is seen as a nexus of knots. For example, changes that are intended to improve

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some things in one part of the organization, might have a negative influence on other parts of the organization. Normal human cognitive abilities hinder the understanding of what is really going on in complex organizations. Feedbacks and delays are quite often vastly underestimated (cf. Senge 1990, 1990a, Kofman & Senge 1993: 7-15).

It is essential to take the time to see events as developing patterns within their context. The better the members' perception of the whole situation, the better they can create links and learn (Sonnenberg & Goldberg 1992: 55). Thus, ineffective short-term solutions are avoided that do not address long-term, systemic problems (Luthans *et al.* 1994: 13).

Systemic thinking, and the resulting sensitiveness for interactive relationships, leads to the collective learning of an organization, which is the basis of a future competitive edge (McGill *et al.* 1992: 12, Senge 1990: 15 and Kofman & Senge 1993: 16f).

According to Kim (1993: 39), "mental models play an active role in what an individual sees and does", because they "represent a person's view of the world, including explicit and implicit understandings." By the explicit description of mental models, an organizational member creates a precise form of expression to further enhance mutual understanding within the organization. Via interpersonal comparison of these different models, a shared mental model of the organization can be developed that is accepted by everyone (Stata 1989: 65ff, McGill *et al.* 1992: 12, Kim 1993: 44-48 and Schein 1993a: 41). Schein (1993a: 41) even stresses: "Any form of organizational learning, therefore, will require the evolution of mental models that cut across the subcultures of the organization."

But it seems questionable that every person in the organization will really reveal his/her model, unless there is an atmosphere of deep mutual trust. Trust building, however, is a task that needs a long time and common experience, and even then it is not certain that every person feels obliged to reveal his/her interests, because for example they sense that if they do so, they become too vulnerable.

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#### 3.3.3. Free Vertical and Horizontal Flow of Information

Free vertical and horizontal flow of information helps to enable a continuous information exchange between different departments and layers of the organization, which is needed for organizational learning.

In the Learning Organization the boundaries are highly permeable (McGill & Slocum 1993: 77). Not only must internal flow of information across functions and projects be guaranteed, but also the integration and, thereby, usage of external information from, e.g., suppliers, customers and even competitors (Leonard-Barton 1992: 25, Garvin 1993: 86f, Luthans *et al.* 1994: 12, McGill & Slocum 1993: 77 and Ulrich *et al.* 1993: 60-65).

Free flow of information should not only occur between specialists. All members of the organization should share information by communication with each other constantly and in an unlimited way (Leonard-Barton 1992: 30). The ideal buildings for the office or shopfloor of the Learning Organization should be constructed in such a way that employees meet as often as possible by chance and, thereby, communicate informally with each other. This facilitates the flow of information (Leonard-Barton 1992: 29).

Face-to-face communication (Shrivastava 1983: 22 and McGill & Slocum 1993: 77) is the preferred method of interaction. Supporting ways and means for this are conferences, meetings, seminars and intra- or inter-organizational project teams (Garvin 1993: 91 and Ulrich *et al.* 1993: 61-65).

The organization should actively support the communication of its members “by providing easy access and proximity in location” (Shrivastava 1983: 22), and by keeping the lines of communication open and flexible (de Geus 1989: 34, Klimecki *et al.* 1991: 141f and Garvin 1993: 91). Everybody has to be able to share his/her experiences and conclusions derived from this with other members of the organization (Probst 1992: 476). Space for dialogue, in a context which is free of hierarchies, is an essential condition for discussion between employees in the Learning Organization (Pawlowsky 1992: 223).

However, how is it decided which information is valuable for other members and the organization? One can easily imagine that it cannot be



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efficient for the organization when everybody produces information and, therefore, real action is suffering.

In reality, there are impediments which hinder the flow of information within an organization, and there is no indication in the literature about how organizational learning can deal with this problem.

As people are normally raised with the wisdom of “knowledge is power”, they instinctively know that knowledge should be kept for oneself, if possible. So how can, for example, senior employees be convinced to pass over information to less senior employees, without fearing a loss of power and influence? Also, the flow of information can be hampered, for example, by the sheer fact that people dislike each other, which sometimes cumulates into a refusal to speak to each other directly.

#### 3.3.4. Education and Training of the Whole Workforce

Education and training of the whole workforce is done in the Learning Organization to ensure that organizational learning happens in the most efficient way. An important issue here is that this education and training must be adequate to achieve the aim of organizational learning

Team members should be trained to engage in dialogue and discussion: dialogue in the form of free and creative investigation of complex and deep-rooted problems, discussion to present and defend diverse opinions and views (Senge 1990: 237).

In order to become and stay a Learning Organization, considerable investments have to be made by the Learning Organization into the human capital on a continuous basis, whereby learning abilities plays a major role.

A decisive part of the learning infrastructure of the Learning Organization is that education and training is done at all levels and in all functions (Puick 1988: 81 and Leonard-Barton 1992: 30f). This can be achieved, for example, by systematic job rotations across organizational units or by promoting forces which drive learning (Ulrich *et al.* 1993: 65).

Garvin (1993: 83) stresses that “managers and employees . . . are trained in the skills required to perform and evaluate experiments”. These comprise skills like statistical methods, graphical techniques and creativity techniques (Garvin 1993: 83).

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Attention has to be drawn not only to financial, but also to non-financial investments into learning, like senior management attending seminars, or the permanent sharing of best practices across the organization, in order to increase the commitment of its members (Ulrich *et al.* 1993: 61).

Acquiring new abilities can also be rewarded monetarily, to give an incentive for education and training (Leonard-Barton 1992: 27).

The question remains how to handle the teaching of certain interpersonal skills, such as communicating, listening and facilitating, which are very important within Learning Organizations.

If employees (especially management) fail to adopt the required interpersonal skills, because they are not willing to change, can they stay in the Learning Organization or do they have to leave? This problem will occur especially when an organization is in the process of being transformed into the Learning Organization.

#### 3.3.5. Learning Reward Systems for Employees

Learning reward systems for employees, which can constitute a combination of different incentives, are important for the continuation of organizational learning, in a self-perpetuated systematic process.

“Reward systems in the Learning Organization recognise and reinforce learning”, they “are tied to risk-taking, flexibility, continuous improvement and other behaviour that Learning Organizations require. More than this, it means that punishments for failure and dissent are eliminated.” (McGill & Slocum 1993: 78).

“Reward systems can be designed to favour organizational curiosity and to discourage complacency”, suggests Hedberg (1981: 21). Additionally, management actions in Learning Organizations are mostly aimed at a long-term rewarding system that motivates the employees to learn (McGill *et al.* 1992: 13).

“Successful ongoing programs also require an incentive system that favors risk-taking. Employees must feel that the benefits of experimentation exceeds the costs, otherwise, they will not participate.” (Garvin 1993: 83). Performance judgement and an incentive system have to

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honour learning actions and outcomes, as well as experimentation (Ulrich *et al.* 1993: 65).

The bonus plans for employees of all hierarchies can be linked to the personally-susceptible profits and turnovers, but they have to be in harmony with the profit and turnover of the whole company (Sirkin & Stalk 1990: 27 and Leonard-Barton 1992: 28). With the distribution of shares as boni, the feeling of belonging together is additionally strengthened (Leonard-Barton 1992: 28).

It would be interesting to know what form non-monetary incentives may take, and whether they are more or less successful than monetary incentives, in eliciting learning-oriented behaviour. Do these incentives have any significant influence at all?

#### 3.3.6. Continuous Improvement of Work

Continuous improvement of work is vital for Learning Organizations to ensure steady organizational learning regarding efficiency and effectiveness of tasks. Work comprises, e.g., standard of work and work flow, service or job safety. For example, with a permanent improvement of quality in production, it is possible to reduce waste and repairs and, thereby, costs. Thus, better quality with lower prices can be achieved at the same time.

“Continuous improvement requires a commitment to learning”, states Garvin (1993: 78). Learning Organizations rely on scientific methods when they diagnose problems, and base their decision-making on data rather than assumptions (Garvin 1993: 81).

To perpetuate the learning process, competition among different teams can be encouraged. For example, if there is time pressure, different groups, competing with each other, can try to reach a goal independently (Nonaka 1992: 101).

Every employee is tied into projects to improve processes (Leonard-Barton 1992: 27). With the help of a standardised system of work, the learning process is more effective in view of achieving continuous improvements. By detailed standardization of work methods, the new knowledge can be disseminated easily throughout the whole organization (Adler 1993: 103f and Adler & Cole 1993: 89).

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“The use of process measures can build the learning commitment.” (Ulrich *et al.* 1993: 61). An example of how this is done is described by Adler & Cole (1993: 89f) as “democratic Taylorism”, which means that working methods and standards are imposed by the working team itself: the workers are trained to measure their work with a stopwatch, in order to compare the times with different working methods, and to decide which one is the most efficient.

Is this continuous process initiated by management, by employees or both? And how do Learning Organizations keep the wheel of continuous improvement going? Is it by systems, by people or by culture or by a combination of these elements?

#### 3.3.7. Flexibility of Company Strategy and Employees

Flexibility of company strategy and employees provides the Learning Organization with enough flexibility and diversity for a broad scope of organizational learning.

Flexibility, especially at the cognitive level, is a decisive preposition to learn organizationally (Klimecki *et. al.* 1991: 143).

The strategic position of an organization influences the capacity to learn in two ways. On the one hand, it poses a boundary to the scope of decision-making, and, on the other hand, it builds a context for the reception and interpretation of the environment (Cyert & March 1963: 171-76, Daft & Weick 1984: 284-95 and Fiol & Lyles 1985: 805).

Strategic planning has to include scenario analysis, which is a managerial exercise to think through the reaction given different possible future scenarios (Luthans *et al.* 1994: 13). Flexibility becomes the essence of strategic planning (McGill & Slocum 1993: 77).

The potential flexibility of a strategy is vital to quickly react to change.

As a potential flexible strategy can hardly be measured with the help of pace of change, particularly in a stable environment, the question arises, how can the evaluation be operationalized? The best potential flexible strategy is useless, if the organization fails to transform it into action when needed.

However, not only the strategy, but also the members of the organization have to be flexible. A strategic rotation of employees between



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various divisions and functions is suggested to be an essential contribution to promote the flexibility of the employees. Garvin (1993: 87) suggests that "personnel rotation programs are one of the most powerful methods of transferring knowledge." This contributes to the process of organizational learning (cf. McGill *et al.* 1992: 12f, Nonaka 1992: 101 and Garvin 1993: 87f).

Despite the advantages of strategic rotation, it appears that too many rotations may harm the integration into teams. And when people come and go, it is harder to attribute the achievements and failures to those employees who were responsible for it. Thus, it is not necessarily the case that more rotation of employees is better for the organization. This is especially the case when specialists do not feel inclined to pass on their knowledge to other employees.

#### 3.3.8. Decentralized Hierarchies and Participative Management

Decentralized hierarchies and participative management give the Learning Organization its guarantee for speed of organizational learning and its implementation, as the decisions are made there where they are implemented.

Decentralization creates closeness to the markets that is especially essential for the survival of an organization in our times of rapid change. Top management's control of the local employees is obtained by shared visions, values and mental models, i.e. in an intrinsic way. Senge (1990: 299, 340-5) sees the new role of the leaders as researcher and designer:

*Researcher* in terms of understanding the organization as a system and its internal and external forces and trends, which drive change.

*Designer* in terms of an organizational architect of learning processes. The leaders build a shared vision with the help of systems thinking.

This role of a researcher and designer of organizational learning processes cannot be delegated to local managers, because they tend to be too involved in day-to-day business, and generally have an inferior perspective to see major, long-term issues and forces (Senge 1990: 287-302).

The structure of an organization plays a decisive role in influencing the learning processes (Fiol & Lyles 1985: 805). Through participation, the

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employees, who are affected by a particular organizational decision, can truly take part in the decision-making process (Klimecki *et al.* 1991: 142). Participative decision-making is also one of the most decisive factors for learning in organizations (Shrivastava 1983: 25).

A decentralized and participative structure for a Learning Organization reduces the need at the top for information at local level and the overall information overload of employees can be diminished. Therefore, the structure of an organization plays an important role in determining these organizational learning processes (Hedberg 1981: 14 and Fiol & Lyles 1985: 805).

Do decentralized hierarchies mean that there is no need for middle management, or does the organizational structure just focus on project-based hierarchies? This style of participative management appears to require top managers as well as middle managers, who are able to lead within a context of the Learning Organization. The question is whether this ability can be taught, or whether only certain personalities have this ability?

In reality, shared visions, values, and mental models may be enough to guide people, but are they sufficient to control them adequately? Are all employees enthusiastic about participative management, or does this model only apply to a limited group of people, who are able and willing to make their own decisions?

#### 3.3.9. Learning Laboratories and Constant Experimentation

Learning laboratories and constant experimentation play an important role for Learning Organizations as they enable organizational learning by trial and error, while limiting the potential risk for the whole organization in case of failure.

The fear of failure is one of the biggest obstacles to learning (Kofman & Senge 1993: 9). Small units of the organization<sup>49</sup> as well as “micro-

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<sup>49</sup> Contrary to the rest of the literature, Leonard-Barton (1992: 23) regards the whole Learning Organization as a learning laboratory. However, this does not exclude a division of the organization, in order to avoid a total collapse, if only one division breaks down because of failed experimentation.

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worlds”<sup>50</sup> are labelled learning laboratories. They are defined by relatively risk free learning environments for the members of the organization.

For Senge (1990a: 21) the exercise of common learning in teams is a crucial aspect that leads to the development of individual learning capability, and, thereby, promotes organizational learning. Best practice, found out by experiments in one part of the organization, is shared with other units (Ulrich *et al.* 1993: 60).

Experimenting includes systematic searching for and testing of new knowledge (Garvin 1993: 81-83). In the Learning Organization everybody must be able to experiment, and eventually even make mistakes, which must have no adverse consequences for those employees (Probst 1992: 476). Everybody is somehow involved in research and development (Leonard-Barton 1992: 31).

McGill & Slocum (1993: 77) state that “management is committed to continuous experimentation as a means of institutionalizing learning.” It is the task of the management “to encourage experimentation . . . and to facilitate the processing of experience.” (McGill & Slocum 1993: 74).

Lastly, Hedberg (1981: 20) explains: “Organizational designs should encourage experimenting so that organizations attain long-term viability.”

Questions arising from these theories are for instance the following:

Are small and medium enterprises capable of using sophisticated and expensive micro-worlds for training and evaluation, or is it only restricted to larger organizations? Are learning laboratories generally more used for training or for model evaluation?

Are there more areas than product development and production process introduction, where experimentation plays a role? Where is the border drawn in reality between experimenting which could not harm the company, and experimenting which might put the company at risk?

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<sup>50</sup> “Micro-worlds” are computer programs that generate situations and procedures in a simulation very close to reality, in order to help people learn more easily and obtain a more profound understanding of reality (Senge 1990a: 313-38).



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#### 3.3.10. Supportive Corporate Learning Culture

Supportive corporate learning culture, supportive to organizational learning, helps the Learning Organization to facilitate and foster organizational learning by a clear set of assisting values and goals.

The characteristics of the Learning Organization mentioned above have to be embedded in a supportive corporate learning culture, and value set, which promotes learning (McGill *et al.* 1992: 13, McGill & Slocum 1993: 76 and Ulrich *et al.* 1993: 64f).

The main responsibility of leaders is to create and foster a climate that promotes learning. McGill & Slocum's (1993: 74) advice to achieve this is: "encourage experimentation, create a climate for open communication, promote constructive dialogue and facilitate the processing of experience".

A supportive corporate learning culture consists of the following elements:

- **Dialogue:** For some authors the word dialogue has its roots in the two Greek words "δια" and "λογος" and means "flowing through" (Isaacs 1993: 25) or "moving through" (Kofman & Senge 1993: 16).<sup>51</sup> "Dialogue, as a discipline now emerging, is a technique for helping individuals recognise and put aside these basic differences. Consequently, higher levels of collaboration are possible." (Luthans *et al.* 1994: 13).

Dialogue is declared to be the first fundamental step for organizational learning, because it facilitates and provides real communication in groups and is a forum for collective talking and thinking (Isaacs 1993: 25, McGill & Slocum 1993: 76f and Schein 1993a: 41).

Dialogue should support the process of communication, not only on managerial level, but throughout the whole organization, and should be particularly used to break hierarchical barriers (Schein 1993a: 50f and Ulrich *et al.* 1993: 65). Senge (1990: 243) quotes Bohm's three basic conditions that are necessary for dialogue: "1. all participants must

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<sup>51</sup> The word dialogue comes in fact from the ancient Greek word "διαλογος" which simply means talk or conversation (the word "λογος" alone has more than hundred meanings). The translation "moving through" originates from Bohm's book "The Special Theory of Relativity" (cf. Senge 1990a: 239f), and has to be regarded as more or less as a definition than a translation.



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‘suspend’ their assumptions, literally to hold them ‘as if suspended before us’; 2. all participants must regard one another as colleagues; 3. there must be a ‘facilitator’ who ‘holds the context’ of dialogue.”

These conditions seem to have a very positive underlying picture of man, but it is doubtful whether it is possible to get all people of one organization to fulfil these demanding requirements. To what extent can dialogue be useful when these conditions are not fully reached?

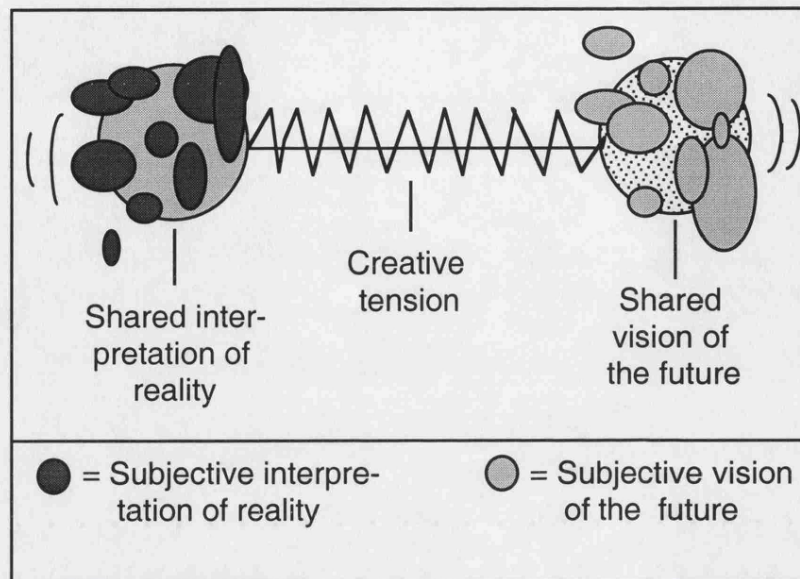
- **Shared interpretation of reality:** Inter-personal shared interpretation of reality means the basic consensus consisting of various subjective interpretations of reality within the organization about the way of interpreting reality (Argyris & Schön 1978: 160, Senge 1990: 8f and 174-204, Klimecki *et al.* 1991: 121f and Pautzke 1989: 111f).

- **Shared vision of the future:** The shared vision is created by personal visions, i.e. the personal mental maps are merged into an organizational mental map. It is essential to give employees the feeling of taking part in the vision of the company. Organizations that want to build a shared vision must continuously encourage their members to develop their own personal vision which is blended into a shared vision, and this again is a guideline for all members (Argyris & Schön 1978: 160, Senge 1990: 9, 205-32, 274f and 1990a: 13f). A shared vision creates commitment and helps to gain support for organizational activities (Luthans *et al.* 1994: 13).

The difference between the shared interpretation of reality and shared vision generates creative tension (see Figure 3.1), which is of vital importance for the organization to enable it to act with anticipation (Senge 1990: 9-11, 150ff, 211-32 and 1990a: 9f). The way of getting from the shared map of reality to the shared vision of the future is by merging both into one organizational map as a guideline for organizational action (cf. also Argyris & Schön 1978: 160).

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**Figure 3.1:** Creative Tension and its Origin



Source: The author's own drawing in reference to Senge (1990: 151 and 1990a: 9).

Does this process apply to Learning Organizations of all sizes, or only to small and medium enterprises, because only their members can meet each other on a regular basis? And how do Learning Organizations treat conflicting subcultures?

**- Openness and trust:** In order to sense trends and take anticipatory decisions, learning needs a true openness of all members of the organization (McGill *et al.* 1992: 11). Openness means the willingness of all members to put their cards on the table, in order to generate interpersonal trust (Shrivastava 1983: 20 and Stata 1989: 70).

Senge (1990: 273-86) divides openness into participative and reflective openness. Whereas the participative openness helps individuals to say what they think, the reflective openness helps individuals to look into themselves. Open communication has to be made possible, in order to enable participative management.

Within Learning Organizations also an openness to knowledge from outside the organization exists. New values are not created by redeveloping already existing things, but by building on the latest existing knowledge (Leonard-Barton 1992: 23).

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Does openness mean that all information must be disclosed, or only information regarding the company? Trust normally takes a long time to establish, but can it be established quickly as well?

**- Commitment and tolerance:** Personal commitment of all employees means the willingness to identify with the company and its aims (Nonaka 1992: 96). As the main aim of the Learning Organization is learning, a commitment to learning is crucial (Ulrich *et al.* 1993: 61), because only that way employees pay enough attention to the growth in knowledge, which is essential for the successful development of the Learning Organization (Sonnenberg & Goldberg 1992: 55). "Without commitment, the hard work required will never be done." (Kofman & Senge 1993: 5).

According to Pawlowsky (1992: 215), tolerance for different perceptions and for subjective interpretation of reality is an essential condition for organizational learning. This tolerance is vital for the development of an organization. Different points of view should even be constantly provoked to enable different perceptions of complex problems (Klimecki *et al.* 1991: 123f and 141f).

However, what happens to people who are not committed; are they trained or do they have to leave the company? The question also arises - does tolerance only apply to minor differences in opinion or also to fundamentally contradictory positions?

**- Risk taking and responsibility:** Two aspects of creativity, which are important for learning, are the above mentioned personal flexibility as well as the willingness to take risks (McGill *et al.* 1992: 12). The management of an Learning Organization in particular has to tolerate certain risk, even force it, in order to acquire new knowledge (Leonard-Barton 1992: 32). A culture must be created in which organizational members feel that they may take informed risks (Ulrich *et al.* 1993: 56). This can go so far as to the management rejecting riskless projects, because they do not generate a decisive competitive edge (Leonard-Barton 1992: 32).

However, despite tolerance of mistakes, it must be ensured that mistakes do not happen twice (Schein 1993: 87). As every member of the organization constructs its own reality, each member is responsible for its own thinking and actions. That means that in the case of failure one has to



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take personal responsibility. This has to be made clear to every organizational member. (Klimecki *et al.* 1991: 125 and Probst 1992: 462ff)

To put it into the words of McGill & Slocum (1993: 76): “A learning culture is characterised by its clear and consistent (1) openness to experience; (2) encouragement of responsible risk taking and (3) willingness to acknowledge failures and learn from them.”

This raises the question what the optimal level for taking risk should be so that effective learning can take place without endangering the organization? Also, can single employees be made responsible for their actions, when the predominant way of working in a Learning Organization is by team work?

In summary, all these ten characteristics above, synthesised from current literature and discussed, appear to play an important role for the Learning Organization as an ideal. It also shows, what the Learning Organization not only could, but also should look like, as current literature is predominantly written in an instructive “management book style”. Some of the questions raised in the discussion will be dealt with in the empirical work of this thesis, which consists of exploratory interviews (Chapter 7), questionnaires (Chapter 8) and in-depth interviews (Chapter 9).

Besides these ten characteristics there are some other elements, which are mentioned in the literature. However, they are not considered as being genuine characteristics of the Learning Organization. For example, following three elements have been mentioned:

“Closeness to the market” (Senge 1990: 287-302 and Ulrich *et al.* 1993: 55), i.e. a close relationship with the customer in order to understand the needs of the customer, is seen as self-evident for the Learning Organization and is included in “inter-organizational team work” as well as in “decentralized hierarchies” in this thesis.

“Leadership” (Senge 1990 and McGill & Slocum 1993: 78), is part of “systemic thinking and mental models” as well as “participative management”. Latter plays a significant role in the creation of the Learning Organization, as the interviews show.

“Information systems” are only mentioned by McGill & Slocum (1993: 77) as a characteristic. However, this thesis does not classify information



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systems as a separate characteristic, as it is indirectly included in “free vertical and horizontal flow of information”, which can also indicate the extent of usage of information systems.

How the different Learning Organization’s characteristics interact, and how they can be ranked in terms of impact on organizational learning, will be discussed in the next section.

#### 3.4. The Ten Learning Organization’s Characteristics: Interdependencies and Ranking

*Why  
want to  
rank them?*

This section gives more detail about the ten characteristics of the Learning Organization: an evaluation of interdependencies and a theoretical evaluation of the impact of the characteristics on organizational learning.

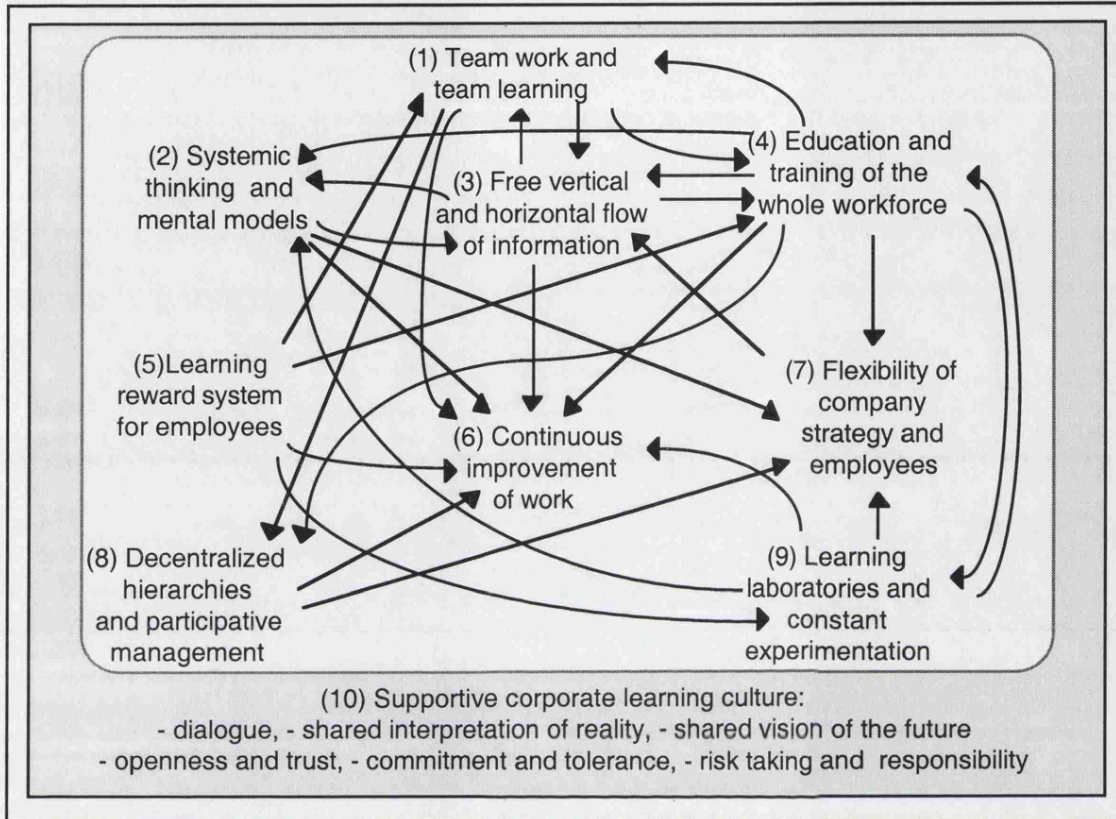
##### 3.4.1. Interdependencies between the Characteristics of the Learning Organization

The main interdependencies among the characteristics of the Learning Organization are shown in Figure 3.2 below.

*So it is  
extensive  
but very  
one-  
dimensional  
shallow*

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**Figure 3.2: Interdependencies between the Characteristics of the Learning Organization**



!!!  
yes,  
system  
theory!

(1) **Team work and team learning** facilitates (3) free vertical and horizontal flow of information, especially when team members come from different departments and different hierarchical levels. Again, the free information flow helps the teams to work and learn. Another advantage of (1) team work and team learning is that team members receive (4) education and training from other members during the project. However, (4) education and training of the whole workforce also enables staff to (1) work and learn in teams. Lastly, (1) team work and team learning is one of the key elements of (6) continuous improvement of work, because the permanent exchange of information fosters an innovative environment.

(2) **Systemic thinking and mental models** are pursued and designed by groups of people and, thereby, facilitate (3) free flow of information. Also, the amount of (3) free vertical and horizontal flow of information has a positive impact on (2) systemic thinking and mental

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

models. (2) Systemic thinking and mental models keep (6) the continuous improvement of work going, as it is the logical answer to a changing environment, and (7) the company's flexible strategy, especially scenario analysis induces thinking in alternatives, which creates flexibility.

**(3) Free vertical and horizontal flow of information** has a positive impact on (4) education and training of the whole workforce (inclusive management), whenever information is valuable. And where (4) education and training improves communication, it promotes (3) the free flow of information. If (3) free vertical and horizontal flow of information is enforced by scientific methods, it contributes to the (6) continuous improvement of work.

**(4) Education and training of the whole workforce** also has various interdependencies. By teaching the knowledge needed, it enables staff to do (2) systemic thinking and talk about their mental models, to (6) improve work continuously and to (7) be more flexible, which in turn can provide a more flexible strategy. (4) Education and training has also a positive impact on (8) decentralized hierarchies and participative management, which presumes that certain prevailing attitudes can be improved. (4) Education and training even improves the usage of (9) learning laboratories and constant experimentation, whereas the usage of these techniques helps to (4) educate and train the workforce through learning by doing.

A **(5) learning reward system for employees** fosters, when it depends on the performance of the whole team, (1) team work and team learning; when it rewards acquiring of new skills, (4) education and training. The (5) reward system also provides incentives for (6) continuous improvement of work and (9) constant experimentation.

**(7) Flexibility of company strategy and employees** has, because of teams designing strategies and the rotation of employees, a fostering effect on the (3) free flow of information within the organization.

**(8) Decentralized hierarchies and participative management** influences the (6) continuous improvement of work, as direct and unconventional action as well as (7) flexibility of employees and company strategy are facilitated. This is because the organization can react faster upon changes in the market.

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

(9) **Learning laboratories and constant experimentation** help to broaden the capabilities of (2) systemic thinking and creating mental models. (9) Learning laboratories and constant experimentation also induce (6) continuous improvement of work and (7) flexibility of strategy and employees.

Last, but not least, a (10) **supportive corporate learning culture**, as part of the ideal Learning Organization, has interdependencies with all characteristics mentioned above. As it would be confusing to draw all links into the exhibit, and in order to underline the supportive character of the corporate culture, it has been presented in the exhibit above by the grey dotted area, which surrounds all other characteristics depicted in the white area. The main elements of this corporate culture are

- dialogue,
- shared interpretation of reality,
- shared vision of the future,
- openness and trust,
- commitment and tolerance and
- risk taking and responsibility.

These different elements of a supportive corporate learning culture seem essential to make the other characteristics of the ideal Learning Organization work.

In summary, this sub-section explained how the different characteristics of the Learning Organization should interact with each other. The next sub-section will discuss how these characteristics can be ranked in terms of their impact on performance of organizational learning.

#### 3.4.2. Ranking of the Learning Organization's Characteristics

The characteristics of the Learning Organization can be ranked according to their impact on the outcome of organizational learning. This order is mainly dependent on whether the elements are sufficient and/or necessary for enhancing organizational learning. However, it is only a theoretical discussion at this stage. The empirical work in Chapter 8 will be able to give a picture what the ranking looks like in reality. Still, first the theoretical discussion on the ranking will follow.



### 3. THE LEARNING ORGANIZATION AS AN IDEAL

The two characteristics of the Learning Organization, “systemic thinking and mental models” and “continuous improvement of work”, are seen to be necessary and sufficient for becoming a Learning Organization, as through them an organization can be developed logically towards the Learning Organization. As a consequence, it is proposed that “systemic thinking and mental models” and “continuous improvement of work” represent the core characteristics of the Learning Organization. *Not all the same?*

“Systemic thinking and mental models” can be regarded as the nucleus of the Learning Organization (cf. also Senge 1990: 12f). It could also be described as the “common sense” of an organization, which follows the goal of perfection in organizational learning: a process with a moving target that can never be reached. A further indicator for the importance of systemic thinking and mental models is the fact that it is the most frequently-mentioned characteristic, as shown above in Table 3.1.

“Continuous improvement of work” can be the improvement of work methods, products, processes or safety. Continuous improvement is the only adequate answer to the insight of the Learning Organization that nothing can ever be perfect, and everything is in a steady flow. Therefore, continuous improvement is an important imperative, which keeps the Learning Organization going.

The other eight characteristics of the Learning Organization are suggested to be necessary, but not sufficient, as their existence alone is not enough for becoming a Learning Organization:

A “supportive corporate learning culture” is suggested to be one of the major characteristics of all the necessary but not sufficient characteristics. This is indicated by the impact it has on other characteristics, as demonstrated in the sub-section above. This supportive corporate learning culture consists of the following six elements:

Firstly, the existence of “openness and trust” does not mean that new things are learnt automatically. It only provides a solid basis for further mechanisms of knowledge acquisition.

The same applies to “dialogue”, because a company can talk about various issues without attaining the (learning) point.

Furthermore, the third element “shared interpretation of reality” and the fourth element “shared vision of the future” do not necessarily facilitate

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learning. Both elements could exist, but members of the organization could be misinterpreting reality, or the shared vision of the future might be a wrong one.

Similarly, the fifth element “commitment and tolerance” alone can exist in any form of organization, and without any challenge, can lead to a company keeping its status quo and as a consequence not encouraging organizational learning.

Finally, the sixth element “risk taking and responsibility” can also lead to an organizational breakdown. Taking too high risks can destroy the organization. This might happen despite employees taking responsibility, which normally anyway is more of a symbolic nature.

In conclusion, other necessary but not sufficient characteristics are required in addition to the supporting Learning Organization’s culture. These characteristics enable the Learning Organization to learn, as a sort of mechanism for organizational learning:

“Team work and team learning” is important as a structure, or catalyst, that enables individual learning to be transferred into organizational learning.

“Free vertical and horizontal flow of information” is important to enable individual and team learning, and, therefore, organizational learning. The right balance of amount of information and content is important in order to avoid information overload.

“Education and training of the whole workforce” is another means to foster organizational learning; not necessarily the time spent in teaching, but the content is especially important. Sometimes, content can only be taught in an informal way, and this applies particularly to tacit knowledge. Thus, it is harder to recognise for an observer.

A “learning reward system for employees” need not only be monetary, which in fact can also have dysfunctional effects on organizational learning. The learning reward system can also be manifested in a subtle way in the form of promotion, or merely the praise by superiors for achieving an improvement.

“Flexibility of company strategy and employees” is not only an important instrument to make the strategy and employees flexible, in order to improve organizational learning, but it is also a selection mechanism that

### 3. THE LEARNING ORGANIZATION AS AN IDEAL

attracts flexible people and distracts inflexible people from joining, or staying with, the company.

“Decentralized hierarchies and participative management” is another tool to enable organizational learning in all different parts of the organization. It also enables a smoother transformation of organizational knowledge learnt into organizational learning outcomes.

“Learning laboratories and constant experimentation” is the last but not least characteristic that enhances organizational learning, as new things can be learnt without putting the whole organization at risk.

In summary, all these are the characteristics of an ideal Learning Organization as described in literature. Whether they appear in reality and in what combination, is investigated in the empirical chapters below. Furthermore, a final ranking is done in Chapter 10, which also draws from the empirical insights of this thesis.

This chapter elaborated the model of the Learning Organization with its characteristics, which are conducive to organizational learning.

The next chapter presents the history of learning of Japan and the Japanese car industry, to gain a better theoretical insight into why many Japanese companies are claimed to be Learning Organizations in current literature.

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#### 4. Learning History of Japan and the Japanese Car Industry

So far, this thesis so dealt with organizational learning in Chapter 2 and the Learning Organization in Chapter 3, both with a theoretical focus, which will be concluded in this chapter. Chapter 4 explores the generation of the Learning Organization by Japanese car assemblers, and the transfer of this model to their car component suppliers. This path has been chosen because literature on organizational learning and the Learning Organization states that many Japanese companies, in particular car companies, are Learning Organizations (cf., e.g., Senge 1990, Adler & Cole 1993 and Garvin 1993).

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suffices?

In order to fully comprehend why this is the case, it is worth looking at Japanese history to understand how important organizational learning was to Japan's rise in terms of economic power, and why learning, especially organizational learning and the Learning Organization, has been, and still is, very popular in Japan.

To put it in Cole's words (1989: 114): "The Japanese have, of course, a long history of borrowing ideas from foreigners, most notably from the Chinese in the premodern era and from the West over the past one hundred years as they sought to "catch up" with the advanced industrial nations. Based on these historical experiences, they have institutionalized a highly eclectic approach to learning."

read  
directly?

This chapter deals with the Japanese history of learning and teaching, in particular the Japanese car industry. Firstly, the reasons for and roots of learning of the Japanese state in the second half of the last century are presented. Then, the organizational learning process of Japanese automobile producers in this century in conjunction with their suppliers is explored. Lastly, the influence of internationalization of Japanese companies on spreading organizational learning and the model of the Learning Organization world-wide is analysed.



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

##### 4.1. Learning in Japan from 1867 to World War II<sup>52</sup>

Since 1600-3, Japan had been a country cut off from nearly all foreign influences for more than 250 years by a decree of the Tokugawa shoguns that did not allow foreigners to stay in Japan. International trade was also banned.

In 1854, the Americans forced the Japanese to sign the Treaty of Kanagawa, which was very unfavourable for the latter. Similar treaties with other imperial powers like Russia, Britain and France followed. This caused a broad discussion in Japan of how to deal with foreigners. They were not welcome, but these militarily superior countries could not easily be expelled. The only realistic way of catching up with Western science and technology was to learn from them very quickly.

By then, Japan had been a feudalistic state with a shogun of the Tokugawa clan in power. The emperor had virtually no political power at all. However, the more obvious it became that the economic and military power of the Tokugawa clan was in decline the stronger the opposition became.

In 1867, emperor Komei died and his son Mutsuhito, who also is known as emperor Meiji, succeeded him. The opposition, consisting of four important clans and some wealthy merchants from Osaka, took the chance and won the support of the emperor Meiji for their plan to modernise Japan.

At the beginning of 1868 the power of the emperor was instituted within months and the last shogun Keiki driven out of power. This marked the beginning of the Meiji restoration, which was an age of eager modernization in Japan. It was driven by an elite of bureaucrats, who saw that it was essential to close the gap to the Western technological advantage, in order to be able to defend themselves against foreign invaders.

This meant that Japan had to learn from the West very fast in order to survive. Thus, the reform included all aspects of Japanese life. People from

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<sup>52</sup> Cf. Crome 1994: 21, Lorenz 1994: 12-19, Ploetz 1991: 203f and Westney 1987.

#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

England, America, France and Germany were called into the country<sup>53</sup> to help as railway or shipbuilding engineers, tax and law consultants, farmers and university professors, military advisors and diplomats. At the same time Japanese students were sent to England, America, France and Germany. Additionally, an infrastructure was set up, which helped fuel the Japanese industrial revolution.

The organizational models to learn from were selected - benchmarking of the best world-wide performer in their specific field. For example, the navy was structured on the lines of the successful British navy and the army first after the French army, until it was defeated in 1871 by the Prussian army, which then served as a model (see Table 4.1).

Table 4.1: Major Cases of Organizational Emulation in Meiji Japan

<u>Source</u>	<u>Organization</u>	<u>Year Initiated</u>
Britain	Navy	1869
	Telegraph system	1869
	Postal system	1872
	Postal savings system	1875
France	Army	1869
	Primary school system	1872
	Tokyo Keishi-cho (police)	1874
	Judicial system	1872
	Kempeitai (military police)	1881
United States	Primary school system <sup>a</sup>	1879
	National bank system	1872
	Sapporo Agricultural College	1879
Germany	Army <sup>a</sup>	1878
Belgium	Bank of Japan	1872

<sup>a</sup> Reorganization on a new model.

Source: Westney 1987: 13.

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<sup>53</sup> According to Westney (1987: 19) the Japanese government employed over 2,400 foreigners from twenty-three different nations.



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

It was the rapid learning and use of foreign knowledge that not only enabled Japan to win the war against China in 1887, and against Russia in 1905, it also gave Japan the power to get rid of the unequal treaties with western imperial nations, and sometimes even change them into more favourable agreements.

*relevance?*

##### 4.2. Learning in Japan since the end of World War II<sup>54</sup>

According to the Japan External Trade Organization (JETRO) the label “Made in Japan” was once synonymous with bad quality and cheap products (Trevor 1986, cf. also Russell & Taylor 1995: 75).

A considerable change in the countries that provided a learning role model took place after World War II, which can be described as the Americans replacing the Europeans as a role model. Well-known names like Edward Deming and Joseph Juran stood for successful promoters of quality in Japan.

*style again*

Cole (1989: 272-303) describes the work of the Japanese Union of Scientists and Engineers (JUSE) as being the major organization in Japan guiding the diffusion of quality-control (QC) circles<sup>55</sup>. This started more informally directly after World War II, but was institutionalized in 1962 as a unit of JUSE, called QC Circle Centre, in order to promote circle activities. In 1964, over 1,000 QC circles were registered, and by 1987 about 250,000 QC circles. Thus, JUSE provided strong guidance and co-ordination for the QC circle movement in Japan. Its QC circle chapters (i.e. outlets) provided for blue-collar workers an effective learning network across firms with the help of strong management support.

However, there was also an official **“U. S. Training Within Industries” (TWI) Programme**, which is worth mentioning.

After the Americans had occupied Japan after World War II Japanese industrial production fell to a level of 10% of the value of 1935-37. This caused the Americans under the guidance of General MacArthur to do something against this economic decline which threatened the stability and the democracy of the country.

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<sup>54</sup> Robinson & Schroeder 1993: 35-57.

<sup>55</sup> For a description of Quality Circles see Dore & Sako 1989: 94 or Russell & Taylor 1995: 106f.

#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

As there was a lack of skilled labour, it was decided to introduce the “U. S. Training Within Industries” Programme, which was developed and introduced in war-time America between 1941 and 1943. The programme was supposed to boost productivity and quality on a national scale, as well as train the specialists needed quickly. As the time available was short people had to be trained with the help of multiplier effects<sup>56</sup>, which was quicker than providing support on an one-by-one basis. Starting in 1951 in Japan, TWI was very successful in increasing the number of skilled workers by breaking down the work into small steps.

TWI consisted of three major modules, which were Job Instruction Training (principles of instruction), Job Method Training (continuous improvement) and Job Relations Training (human relations).

The main objective of TWI’s **Job Instruction Training (JIT)** was to help supervisors develop a well-trained workforce (i.e. less scrap, rework and rejects; fewer accidents; less tool and equipment damage).

The seminar training method of JIT consisted of four steps:

- 1) the trainee is put at ease and made interested;
- 2) the job is taught with key points identified;
- 3) trial runs are made and the trainee is obliged to explain and demonstrate the reasons for each step; and
- 4) coaching is tapered off and the trainee is told whom to see if he or she has any problems or further questions.

As learning-by-doing was emphasized, the approach was trained with the help of models at the end of the seminar.

The aim of TWI’s **Job Method Training (JMT)** was to help companies produce better quality products in less time, by making the best use of the manpower, machines and materials available.

JMT taught the following four step method:

- 1) break down the job into its constituent operations;
- 2) question every detail (why? what? where? when? who? how?);

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<sup>56</sup> With the help of training the trainers that trained trainers again cumulative returns were achieved in a very short time. In order to keep the quality standards, precise instructions about the way of presenting the material were developed.



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

- 3) develop the new method by eliminating, combining, rearranging and simplifying all necessary details; and
- 4) apply the new method by selling it to everyone.

The fourth step was seen to be the crucial one for spreading new knowledge throughout the company, which was the essential step from the organizational learning point of view. For the instructors JMT even provided answers to possible trainee's questions<sup>57</sup>.

The goal of TWI's **Job Relations Training (JRT)** was to improve and accelerate the training of supervisors in handling human problems under their charge so as to secure maximum co-operation.

The four steps of JRT to deal with job-related problems were:

- 1) get the facts (be sure you have the whole story);
- 2) evaluate and decide (do not jump to conclusions);
- 3) take action (do not pass the buck); and
- 4) check results (did your action help production?).

*relevance & detail?*

In order to demonstrate how widespread the system of TWI is in Japan today, Robinson & Schroeder (1993: 49) provide a picture each of a small American JMT card from 1945 and a small Japanese JM card from 1992, which have the same in layout and the same content (i.e. a summary of the three modules) and only differ in the characters of the two languages.

As many companies incorporated TWI Programmes with a different label, the real effect is hard to measure, because the internal programs within the companies are hardly identifiable. However, the overall number of all Japanese TWI Programme graduates is certainly higher than the official number of 64,000 graduates alone in 1991. Toyota, for example, was one of the earlier adopters of TWI called "Toyota TWI", which even played an important role in designing the Toyota Production System (TPS), according to a former Japanese managing director of Toyota, who helped to design and introduce TPS (Robinson & Schroeder 1993: 51f).

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<sup>57</sup> For example, TWI Service suggest in 1945 (cf. Robinson & Schroeder 1993: 42):

"[Question]: What should be done if employees are eliminated as a result of a methods change?

[Answer]: This problem is solely one for the company to handle. . . . [however] it is recommended: that no one ever is laid off as a result of a methods change but that an employee thus affected be transferred."

#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

This speedy introduction of the TWI programme in Japan (double-loop learning) seemed to have been only possible with the pressure of the severe economic crisis after the war that amplified change, because it showed that the old business governing values in Japan were not successful anymore. Thus, on the macro level of Japan's economy a change learning process was performed, installing new governing values, which enabled organizational learning on the micro level of companies. However, although the Robinson & Schroeder (1993: 45) state that TWI was introduced in Great Britain in 1944, they give no reason why Britain failed to be successful in quality and, therefore, did not show a similar economic success.

The reasons for the lack of success of the TWI Programme in Great Britain can be summarized as follows: British government and British firms lacked the vast experience of Japan since 1868 of identifying the best practice world-wide and quickly introducing it on a national level. Additionally, Britain did not have such a severe economic crisis compared to the one Japan had after World War II, which did not make British companies so receptive for change.

Whitehead & Partners (1976) give the following reasons why the TWI programme in Great Britain faded. Firstly, the competition for the traditional TWI supervisor courses from other agencies, offering similar courses of a lower quality standard, increased. Secondly, the length of the courses offered was considerably longer than the original limit of 10 hours<sup>58</sup>. Thirdly, there was a lack of marketing for the courses, because TWI was performed by a governmental agency. Lastly, the service was not free for the users.

After having presented the Japanese learning up to the present, this thesis now focuses on the specific development of the automobile industry in the 20th century in the light of this learning experience.

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<sup>58</sup> Some courses lasted between 25 and 50 hours (Training Service Agency 1977: 48), which was against the initial aim of the programme of "... utilizing a minimum of time" (Training Within Industry Service 1945: 32).



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

##### 4.3. Learning History of Japan's Automobile Industry<sup>59</sup>

Although the first automobile was built in Japan in 1902, it took a long time to build up a larger automobile industry against strong foreign competition, especially from America.

An important reason for beginning automobile production on a large scale was the Automotive Manufacturing Industries Law (Jidosha Seizo Jigyo Ho) of 1935. It enabled two companies, namely Toyota and Nissan, to start automobile production under newly-erected tax barriers against foreign competition. World War II ended the foreign car manufacturing in Japan and a third Japanese producer, Diesel Jidosha Kogyo, joined.

However, there was a significant difference in the way Nissan and Toyota were managed. Nissan had strong links with General Motors in the 1930s and, therefore, relied more on Taylorist/Fordist methods. Toyota, however, tried to develop its own system through an iterative organizational learning process. The Toyota system was developed under the aegis of Taiichi Ohno, which involved kanban<sup>60</sup> and just-in-time techniques, including a well-designed system of sub-contracting (cf. also Cusumano 1985: 27-72, 375-81 and Warner 1994: 518).

The early 1950s were marked by severe strikes at Toyota (1950) and at Nissan (1953), which induced organizational learning on the double-loop level for both companies. Whereas Toyota learnt co-operation between labour and management with the help of discussions<sup>61</sup>, Nissan first dismissed many old union members, but then learnt co-operation with the new union. In 1952, passenger car production was resumed again after the strikes, mainly to supply taxis.

1950s  
links  
+ superficial  
application

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<sup>59</sup> Based on Shimokawa 1994, unless other authors are quoted (see also Cusumano 1985).

<sup>60</sup> Kanban means pull-delivery: new parts are ordered by sending emptied boxes of them back to the supplier. Thus, new parts should be only produced when they are needed (cf. also Womack *et al.* 1990: 62).

<sup>61</sup> Shimokawa (1994: 36) notes that Toyota introduced management and labour council meetings, which discussed all major problems regarding the relationship between management and labour.

#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

There was also an organizational learning process going on in form of a transfer of technology from European car producers<sup>62</sup> and their suppliers, in order to improve design, engineering and the production of cars and components. This trend was backed by the MITI (Ministry of International Trade and Industry), which supported and protected its own domestic automobile industry.

In the early 1950s, Toyota also started to improve its suppliers, by teaching them organizational learning, which involved the areas of systematic cost reduction, technological improvements and information sharing (i.e. inter-organizational learning). In order to secure quality, techniques like Statistical Process Control (SPC)<sup>63</sup>, Total Quality Control (TQC) and Quality Circles (QCs)<sup>64</sup> were employed (cf. also Hines 1994: 128). This knowledge was not only spread to suppliers, but also to other Japanese car companies.

In the 1960s, the car industry started to boom and many other Japanese producers joined, such as Daihatsu, Honda, Mazda and Subaru. Following MITI's encouragement, automotive suppliers started with restructuring and concentration in the first half of the decade<sup>65</sup>. In the second half of the decade the automobile producers followed this example.

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<sup>62</sup> One reason for choosing European partners was that they were producing small cars. Another reason becomes clear from a statement by Morita (1986: 3f) about his insights after visiting Ford's Rouge car production complex: "I was surprised and puzzled and disappointed to see the very same scenes that I remembered from that film made almost twenty years before - the same equipment seemed to be in service, and it made me wonder then about the future of America's industrial plant and its supreme position, the envy of the world."

<sup>63</sup> Womack *et al.* (1990: 159) provide the following explanation: "With SPC, tool operators record the dimension of each part - or sample of parts - produced. If they notice these dimensions straying from what they should be, they either make the necessary adjustments to the machine, or, if it's a more difficult problem, such as machine malfunction, call for help. In theory, no defective parts should be produced."

<sup>64</sup> For a description of Quality Circles see Dore & Sako 1989: 94 or Russell & Taylor 1995: 106f.

<sup>65</sup> Although some component manufacturers had introduced just-in-time and quality circles in combination with team structure previously, an extensive adoption of these techniques did not exist before the end of the 1960s (Shimokawa 1994: 70-74).



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

By the end of the 1960s and throughout the 1970s the exports of Japanese cars began to grow rapidly.

The 1980s were marked by the establishment of Japanese car plants overseas either in sole ownership or in joint ventures. In America, Honda<sup>66</sup> started car production in 1982, Nissan in 1983, Toyota in 1984 and Mazda in 1987 (Mair *et al.* 1988: 356f).

Then, in the 1990s, Japanese assemblers started production in Britain, with Nissan commencing in 1986, Honda in 1992 and Toyota in 1993 (Lamming 1993: 21 and Shimokawa 1994: 151).

In view of the theory of organizational learning and the Learning Organization, Japanese companies in the car industry not only showed a good capability of double-loop learning (i.e. change learning), but with the help of the government agencies this new knowledge learnt was quickly spread around the industry, including the suppliers. The strikes at Nissan and Toyota in the 1950s showed the management their dependency on the workforce and helped to create an atmosphere which enabled an improved capability for systemic thinking. The history also shows that many other characteristics of the Learning Organization were acquired or improved over time in the car industry, as, for example, continuous improvement, team work and learning or training.

The organizational learning experience of Japanese car producers abroad will be looked at more closely in the next section.

##### 4.4. Learning and Teaching of Japanese Automobile Companies in America

The first Japanese company to start producing cars in America was Honda in 1982. Honda had only entered the Japanese car market in 1963 and, therefore, the American market provided a better growth opportunity for Honda than the Japanese market. However, there were growing trade frictions between America and Japan that were caused by high Japanese exports to the US. Thus, Honda decided to start assembling cars in Ohio, America. Although being the first Japanese car producer to do so, Honda's risk was hedged, because it first tested assembling motorcycles in the US

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<sup>66</sup> Honda had already gained experience by producing motor cycles in America since 1979 (Mair *et al.* 1988: 356 and Mair 1994: 77f).

#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

starting in 1979. This was a much smaller investment, and valuable experience was gained (Ingrassia & White 1994: 326-28, Mair 1994: 77f and Shimokawa 1994: 117).

In 1983, only one year after Honda, Nissan started production in the U.S., also without any partner (Shimokawa 1994: 150).

In 1984, Toyota started a joint venture with GM for car production, called NUMMI (New United Motor Manufacturing Inc.) (Shimokawa 1994: 150). As a latecomer, Toyota was under time pressure. With the help of the alliance with GM it established a factory site and access to the list of GM's preferred American component producers. However, in return GM was allowed to learn from the Toyota Production System; GM seconded 16 managers to NUMMI and was allowed to send employees through the factory on tours to get insights into the superior Japanese production technique (Ingrassia & White 1994: 41f).

Florida & Kenney (1991: 381-98) suggest that the Japanese automobile manufacturers influenced and shaped their environment in the US from a non-supportive one at the start to a supportive environment, by producing cars there. This means, they not only brought Japanese suppliers to produce in America, but they also changed the way of production of American suppliers.

According to Florida & Kenney (1991: 389) it was not the American shopfloor workers who had problems with adaptation, but the middle management, which found it difficult to change their attitude and prejudices towards shopfloor workers.

Florida & Kenney (1991: 391) conclude: "Whereas the literature predicts convergence of Japanese transplants towards the U.S. model, the reverse is occurring as U.S. producers adopt elements of the Japanese model. This further reinforces the contention that the Japanese model is a potentially generalisable successor to fordist mass production." And they state that their "findings indicate that both transplant assemblers and suppliers have been remarkably successful in implanting the Japanese system of work organization in the U.S. environment."

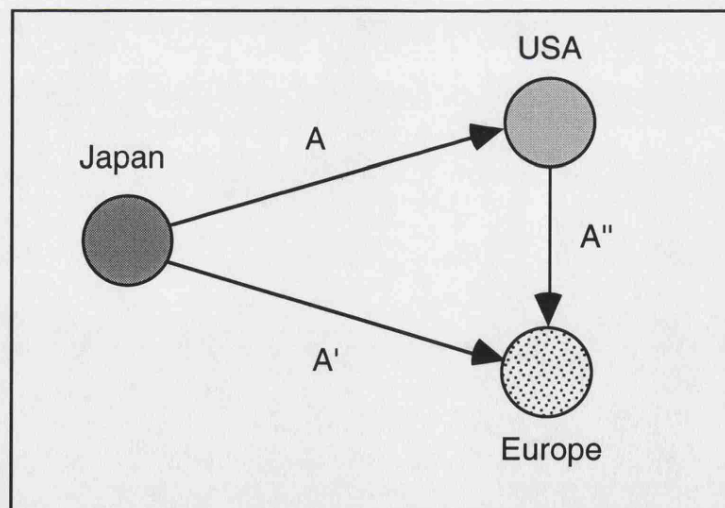
But it is not only America that plays an important role for Japanese foreign direct investments, but also Europe at a slightly later stage.

##### 4.5. Flow of Japanese Knowledge and Know-How to Europe

Fujimoto *et al.* (1994: 381-86) state that the Japanese foreign direct investments in the automotive industry can best be described by a “triangular-unidirectional model” (see Figure 4.1). This configuration shows a repeated and successive flow and application of Japanese knowledge and know-how from Japan to North America, and then from both areas to Europe. A typical example of this triangular-unidirectional model on the supplier level is the case of knowledge and know-how transfer of Nippondenso America to Nippondenso Europe.

The focus of Fujimoto *et al.* is only restricted to the flow of knowledge and know-how through foreign direct investments. Also, no empirical evidence is given on a larger scale. For example, there are also other ways of transfer such as co-operations between European-based suppliers and Japanese suppliers in Japan or North America, or transfer from Japanese car assemblers in Europe to component suppliers in Europe. This thesis will investigate these cases later on.

Figure 4.1: Triangular-Unidirectional Model



Source: Fujimoto et al. 1994: 384.



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Case study literature on component suppliers changing to the Japanese model in Europe is very scarce. Therefore, the following section deals with one level higher, i.e. automobile producers, and mainly plants in America, which reveal some interesting insights for the purpose of this thesis.

4.6. Change Learning of NUMMI vs. Other Car Assembly Plants

Unfortunately, little literature is available how automotive component suppliers conduct change learning in order to become a Learning Organization.<sup>67</sup> Thus, in this section a higher level, i.e. car assembling plants and their change learning, is analysed by comparison to gain some insight into the reasons for successful or unsuccessful change.

NUMMI (New United Motor Manufacturing, Inc.) is chosen as a successful example of change, as this has been discussed in previous literature (cf. Krafcik 1986, Womack *et al.* 1990: 82ff, Adler 1993: 97-108, Adler & Cole 1993: 85-94 and Mahoney & Deckop 1993: 27-38), and is compared to other change projects. Although the US differs in various aspects from the UK (e.g., Industrial Relation System, the supplier base, market and political context), some generalizations can be made, which help to provide a deeper understanding of the whole context and process.

NUMMI is a joint venture between General Motors and Toyota in Fremont, California. The assembly plant was a brownfield site<sup>68</sup> and was turned from a worst performer under GM into a best performer, in terms of productivity and quality, under Toyota. As other attempts to change

<sup>67</sup> Krafcik (1986: 25-30, cf. also Womack *et al.* 1990: 163) gives only one short example of "successful learning" of a supplier: Packard Electric's Mexican plant learnt to improve quality dramatically by stationing a resident engineer in NUMMI as well as getting assistance from a Toyota supplier from Japan.

<sup>68</sup> Brownfield site usually means that a former defunct plant has been used to produce a new product normally with the former workforce, but sometimes a new method of management is introduced. This usually means more resistance to change, mostly because of old employee habits, than building a factory from scratch, which is called greenfield site. Although there was a time lapse of nearly two years before NUMMI started after the close down of the old GM plant, it still can be considered as a brownfield site, because over 80% of the old shopfloor workers were rehired (cf. Krafcik 1986, Mair *et al.* 1988: 367 and Womack *et al.* 1990: 82ff).



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how is this being operationalised

towards the Learning Organization, or at least introduce parts of it, appear not to have been so successful as in NUMMI's case, it is worthwhile comparing NUMMI to six other different plants.

Furthermore, it is interesting to see the different strategies of Toyota and GM to learn from NUMMI and diffuse that knowledge, as suggested by Krafcik (1986: 13-20). Generally, Toyota had not only a core staff of 30 to 35 managers, but also a support staff of 30 to 60 lower level management and engineers, which were rotated every three months. In comparison, GM had only 15 managers at NUMMI which stayed for three years and this time period was then reduced to two years. Also, GM had a liaison office that was responsible for systematic examination of NUMMI's management techniques and the sharing of this information across GM with the support of videos, memos and a computer data base. GM's learning style, which also included short factory tours, is criticised by Krafcik as being "too passive in nature" (1986: 18).

This difference in learning techniques can be interpreted as follows. Toyota put emphasis on learning of tacit knowledge through socialization (rotating team managers at a high frequency) and placing them at the new production facilities in the US. GM put emphasis on making the tacit knowledge explicit through externalization (videos, memo and data base), which seems to be not sufficient to grasp the knowledge targeted.

##### 4.6.1. New NUMMI vs. Old GM-Fremont

Adler (1993: 97-108) describes in his article how NUMMI encourages organizational learning and, therefore, continuous improvement. He praises the plant as not only showing world-class productivity and quality, but also increasing worker motivation and satisfaction.

This success was possible, although NUMMI was built on the old GM-Fremont site, which was known to be one of the worst performing plants in the world, and NUMMI even employed 85% of the old shopfloor workers. The introduction of a new management style had been smoothed by the selection of a new management (cf. also Krafcik 1986: 2ff, Mair *et al.* 1988: 367 and Womack *et al.* 1990: 82ff).

The success of NUMMI can best be described in comparison to the old GM-Fremont plant. NUMMI's productivity was twice as high as GM-

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Fremont, and better than any other GM plant at the end of 1986. Absenteeism dropped from 20 - 25% to 3 - 4%. NUMMI's quality of products was also higher than that of any other GM products, whereas GM-Fremont's product quality was the worst of all. Participation in quality programs rose from 26% in 1986 to 92% in 1991. And the number of workers who indicated they were "satisfied" or "very satisfied" was over 90% in the same year.

Adler (1993: 102-5) suggests that fear, selection and socialization were some important factors contributing to the successful turnaround of NUMMI. However, they were not sufficient to explain it entirely. Thus, he adds two further factors, which are standardized work and an atmosphere of trust and common purpose.

The *standardized work* includes detecting faults automatically, improving work continuously and rotating within standardized jobs.

An *atmosphere of trust and common purpose* was created by building consensus for major decisions, a no-lay-off policy, so that employees could be sure that nobody was to be fired because of a productivity improvement, and by management actions that helped worker problem-solving and showed that they were on their side and were dependent on the workers.

A further reason for the success of NUMMI's change, which is not indicated by Adler's paper, is the selection of a new management. None of the former management was hired again after the pause between the closing down in 1982 and the reopening in 1984. Instead the old management had been transferred to other places in the GM-world. Furthermore, Krafcik (1986: 16) and Ingrassia & White (1994: 41f) indicate that only around 15 to 16 GM middle managers were working for NUMMI, and that they all were selected by Toyota. Thus, it was easier to implement a new corporate culture with a different, i.e. positive, attitude of management towards employees.

The fact that NUMMI had no special parking and catering facilities for management, and uniforms were identical for everyone, was also a passive selection mechanism, because this did not appeal to status-dependent managers. Through their action the new management gradually gained the confidence and trust of the shopfloor workers. And in difficult situations they tried to keep the good relationship and did not destroy it, e.g., in an economic downturn no employees were fired.



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*quite misses the point or Adler here superficial again*

Adler (1993: 108) labels NUMMI a “learning-oriented bureaucracy”, because according to him it is a formal system which encourages learning. After training, team members analyse their work with stopwatches, describe it and improve it. However, the term “learning-oriented bureaucracy” can be highly misleading, as in a bureaucracy the experts learn for the workers, according to Weber (1947), because of the concept of division of labour into thinking and manual work. And when a one-best way is found, it is hardly possible to make an improvement, especially for the shopfloor workers, who are not expected to think. Thus, Adler’s term of a “learning-oriented bureaucracy” neither seems adequate to describe the novelty of the NUMMI (or Toyota) Production System, nor are institutionalized systems for learning enough for being successful at a car assembly plant, as the next sections will show.

##### 4.6.2. NUMMI vs. Uddevalla

Adler & Cole (1993: 85-94) compare NUMMI with Uddevalla, a car assembly plant of Volvo in Sweden, which was closed down in 1993. They especially concentrate on the different modes of learning. They conclude that the main difference lies in the aims of the two production plants.

The NUMMI efficient-production approach is driven by the consumer market, and, thus, is designed to maximise organizational learning. This ensures a growth in productivity as well as in quality.

Uddevalla’s human-centred approach is driven by the labour market, and, thus, is designed to maximise individual learning. It was hoped that this would improve workers’ satisfaction.

Adler & Cole (1993: 86ff) argue that organizational learning is much harder to pursue at Uddevalla, as there was no exchange of information between teams; and work cycles at Uddevalla were less standardized and took much longer than at NUMMI.

Although Uddevalla’s main design purpose was human-centred, its absenteeism was at 22% about seven times higher than at NUMMI with 3%. Additionally, satisfaction at Uddevalla was not very different from traditional Volvo plants, whereas internal worker surveys at NUMMI showed that over 90% of the workers were satisfied or very satisfied. However, Adler and Cole state that NUMMI might be a modified version

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of the Japanese production model, which is designed to achieve a higher employee satisfaction in the different environment of America, in order to avoid problems with the workforce.

Adler & Cole (1993: 89) call the well-documented process of NUMMI “democratic Taylorism”. This can be misleading, as can the labelling “learning-oriented bureaucracy” (Adler 1993). Firstly, this type of management is not necessarily only based on democratic decisions. Secondly, it would be too simplistic to explain NUMMI’s successful performance only monocausally. Therefore, it is suggested, especially as Adler & Cole praise NUMMI’s ability at organizational learning, that it is more appropriate to call it a Learning Organization as it shows various of its characteristics, previously explained in Chapter 3.

Berggren (1994: 37-45) tries to defend the position that Uddevalla was successful in organizational learning in a later article. He criticises Adler and Cole for not studying learning as a process over time and shows a chart of Uddevalla’s productivity improvements.

However, this chart shows steep productivity improvements only after the summer vacation in 1992 when a new management took over that introduced new organizational learning techniques, which did not exist when Adler & Cole visited the plant. Among these new techniques were inter-team learning, involvement of salaried employees in direct production activities, procedure documents and a plantwide kaizen (continuous improvement) programme (cf. also Adler & Cole 1994: 45-49).

##### 4.6.3. NUMMI vs. GM-Van-Nuys

A further comparison of NUMMI to another car manufacturing plant originates from Mahoney & Deckop (1993: 27-38) with the GM-Van-Nuys car assembly plant in California, which was closed in 1992. Discussing the reasons for the difference in the success of the turnaround, the shock of plant closures and selective rehiring are judged by Mahoney and Deckop to carry similar weight and are, thus, of minor impact. Therefore, they mainly focus on the creation of creating mutual trust and co-operation.

The specific difference in teamwork is seen in the building-up of trust and co-operation by the management of NUMMI, which was not done in

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the GM-Van-Nuys plant. Intensive training was done with both workforces, which indicates that training alone is not sufficient, but it also raises the question about the content of the training given.

Furthermore, management at NUMMI did not intervene in internal union decisions. However, GM-Van-Nuys' management did not even seek consultation with the union in cases of differing opinions and preferred to act on their own, which did not encourage the creation of mutual trust.

Additionally, NUMMI recognised the role of job security and gave a pledge that it would not lay-off workers unless, after cuts in management salaries, the viability of the company was at stake. Van-Nuys, on the other hand, made a similar pledge, but made several lay-offs without cutting management's salary before closure, which destroyed any trustworthy relationship. This shows that indicators like a commonly agreed "no-lay-off policy" are not enough to establish respect and trust between management and shopfloor workers. It was not only the case that the no-layoff pledge at Van-Nuys was violated, but there was also no indication that management would try everything to avoid redundancies.

As a result, the quality of products at NUMMI improved dramatically to levels comparable with Toyota Japan, whereas Van-Nuys' bad quality did not improve at all.

According to Mahoney & Deckop (1993: 31) one influential reason for the differing managerial values was that NUMMI's management was selected by Toyota, while Van-Nuys' management was the old GM management a GM culture and philosophy that had not changed materially.

##### 4.6.4. NUMMI vs. CAMI

Robertson *et al.* (1992: 77-106) outline different aspects of CAMI (Canadian Auto Manufacturing Inc.), which is a joint venture between Suzuki and General Motors. It is a greenfield site and the only unionised assembly plant in Canada. The publicly-stated values of CAMI, which are empowerment, kaizen (i.e. continuous improvement), open communication and team spirit, do not seem to be in operation, apart from intense kaizen. Robertson *et al.* (1992: 87) see kaizen as the "primary source of profits at CAMI through the elimination of waste". However, it should be noted that

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this does not include the importance of the fact that kaizen can also make work easier and reduce injuries to employees.

This point is made by Toyota (TOYOTA 1994): “Kaizen is the dynamic of continuous effort to make standardised work ever-more efficient and enjoyable.” Thus, it would be misleading to give the impression that the CAMI version is an exemplary Japanese production system, as Robertson *et al.* (1992: 77-106) suggest, because it is just an adapted form of the Suzuki production system and cannot be generalized.

In fact, according to Ingrassia & White (1994: 359) a Suzuki advisor to GM staff for CAMI told them that Suzuki had studied the Toyota Production System (TPS), then adapted it to Suzuki’s needs and called it the Nagare<sup>69</sup> Production System. This adaptation by Suzuki might have changed the TPS considerably.

The suggestion programme at NUMMI registered over 10,000 suggestions in 1991, of which more than 80% were implemented (Adler 1993: 104). In comparison, CAMI registered 81,254 suggestions (teian) in the first ten months of 1990, of which 76% were implemented and another 22% were approved or under evaluation according to the management.

There are three major possible reasons for this significant difference in the number of suggestions received. Firstly, NUMMI started production in 1984, whereas CAMI started in 1989 (Shimokawa 1994: 150f). This means that NUMMI was in a relatively mature state after having operated for six years, whereas CAMI was in its first year of operation, and thus had many more things to improve being in the start-up phase. Secondly, as Robertson *et al.* (1992: 89f) state, a decreasing number of employees took part in teians at CAMI when they visited the plant for a second time (which underlines the first point). Thirdly, it is not clear what kind of measures were used to classify an improvement. It could be that a teian at CAMI was a smaller measurement unit than suggestion at NUMMI.

Interestingly enough, a strike at CAMI in 1994, which was caused by intense working conditions (König & Riecker 1994: 247), seems to have

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<sup>69</sup> “Nagare” means according to Ingrassia & White (1994: 359) “flow like a river”. Ikeda *et al.* (1988) describe that Toyota also calls its production system “nagare production system”, with the U-line technology (i.e. arrangement of production machines in an U-shape) as an essential part.

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been routed the pressure at CAMI to submit improvement suggestions, which was perceived as being too high by employees. This direct increase in pressure to achieve the goal of continuous improvement, which had the opposite effect of a strike, appears to reflect a falling back into old management values and habits by GM management as regards employee treatment.

##### 4.6.5. NUMMI vs. Saturn

Novak & Fine (1996) compare NUMMI with GM's Saturn plant (the first plant built after the NUMMI experience by GM), and focus on the different management styles of the two plants with respect to how team structure can impact on performance, which is said to be better at NUMMI.

Whereas NUMMI uses a manufacturing process, which it could copy from Toyota's Takaoka plant in Japan, Saturn had to develop everything from scratch. For this reason, Saturn involves workers in the complete car development process, whereas NUMMI limits empowerment to the continuous improvement process. And, last but not least, at Saturn there is a radical "total consensus planning", which can slow down the decision making process considerably, whereas at NUMMI the project leader can and has to take the decision, but also the responsibility.

This comparison between NUMMI and Saturn shows, similar to Uddevalla, that team work alone does not seem to guarantee efficient organizational learning. It rather appears that team work organization has to be purposefully constructed, in order to enable the organization to perform at a high standard.

##### 4.6.6. NUMMI vs. GM-Eisenach

The Eisenach plant belongs to the German affiliate of GM Opel and started operation in October 1992 (Gottschall & Hirn 1992: 204). GM hoped to apply here what it had learnt from NUMMI. For example, the team size at Eisenach was the same as at NUMMI with around 6-8 people. Originally, the team leader used to be elected by the team members. However, this has been changed and is now done by management, and a vacant position is advertised internally.

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The suggestions per employee were 9 in 1993, 13 in 1994 and 18 projected for 1995. Unfortunately, nothing is indicated about the implementation rate. König & Riecker (1994: 234-47) criticise that not the human being, like in the 70s or still at Volvo, but productivity is the aim of the “new German Toyotism”. Work breaks are reduced to increase productivity by the teams themselves now, as the chief shop steward complains.

The Eisenach example shows how long it can take for a Bureaucratic-Tayloristic Organization like GM to learn from best performers (nearly a decade). And this is only one new plant and does not yet mean that the whole of GM has learnt the lessons.

Ingrassia & White (1994: 56ff) describe how Toyota was puzzled by GM’s approach to learning from NUMMI, which offered insights into the Toyota Production System. There were only a lot of factory visits by GM managers, and instead of senior managers, junior managers (not even including plant managers) were transferred from GM to NUMMI. Furthermore, there was no coherent plan of GM’s top management to use and apply the knowledge employees gained at NUMMI. Those NUMMI employees that did not leave GM after their time with NUMMI were spread within the huge organization of GM without any lever to apply the newly-learnt lessons.

Now at Eisenach, GM employees who have learnt Japanese production techniques at NUMMI in America, CAMI in Canada and Isuzu in England were brought together in one plant, in order to demonstrate that GM was capable of producing cars efficiently. The opportunity of having people with relevant tacit knowledge and East Germans who were in the process of unlearning, together with the perceived threat from more efficient lean production technologies within GM Europe, made a change in learning for GM possible in theory. Only the combination of top managers from GM Europe and Germany, who were convinced by one-week kaizen courses about the necessity of change and acted as a catalyst and driver for change learning, made Eisenach happen (cf. also Ingrassia & White 1994: 349-57 and Gottschall & Hirn 1992: 205).



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##### 4.6.7. Lessons Learnt from the Comparative NUMMI Case Studies

What can be deutero-learnt (learning learnt) regarding single-loop learning (adjustment learning) and double-loop learning (change learning) in the examples discussed above? *hmm!*

Regarding **single-loop learning**, a problem arises concerning “the rate of suggestions per employee” and their “implemented percentage”, when shopfloor workers can hardly stand the stress anymore and are ready to strike (as happened in CAMI). This shows that measurable indicators cannot always describe the real situation in a company, and more has not necessarily to be better. It is more a sensible balance of different measures, which seem hard to identify in a quantitative way. The only way to get an accurate picture is to talk to people at different hierarchy levels in the company. Thus, this research will combine questionnaire-based empirical research with exploratory interviews and in-depth interviews with representatives of management and the shopfloor. *copy*  
*organization*

Concerning **double-loop learning**, only NUMMI appears to have made an overall successful change to the Toyota (Japanese) Production System. Therefore, it appears to have a lot of the ten characteristics of the Learning Organization. The major reason for this is a new management, selected according to new organizational values, which stress mutual openness and trust. Without these values either continuous improvement does not work in the short run (e.g., Van-Nuys), or at least industrial relations are severely undermined and do not work in the long run (e.g., CAMI). These new values have to be lived by the management to be implemented, because they are based on the assumption that not only are workers dependent on management, but management is also dependent on workers. This is because only through continuous improvement on the shopfloor, together with management actions, can the competitiveness of the company be secured. *slow*  
*to!*

This relationship between mutual dependence and the need for building up trust in a game theoretical approach<sup>70</sup> is shown in Figure 4.2.

In the case of employees' and managers' distrust, although it is a stable equilibrium (e.g. Van-Nuys), it will lead to an undesirable inefficient

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<sup>70</sup> For more information about game theory see Gibbons 1992.

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outcome for both sides (lose, lose), i.e. plant closure in the long run. The situation of trust only on the employees' side does work for a short period but is unstable (e.g., CAMI) and will turn into a situation with distrust on both sides in the long run, which is inefficient (lose, lose), e.g., a strike at CAMI. Mutual trust on both the employees' and the management's side, however, can lead to an efficient outcome in productivity and quality (win, win), which has to be carefully nurtured through permanent open communication that is going in two directions.

Figure 4.2: Strategic Choice of Co-operation Based on Trust

<b>Employees</b>	trust	lose, win	win, win
	distrust	lose, lose	win, lose
		distrust	trust
		<b>Management</b>	

Note: “win, lose” or “lose, win” situations are normally unstable in the long run; in the short run the person who trusts loses and the person who distrusts wins.

However, the example of Uddevalla shows that, although trust is on both sides, there can be an ineffective outcome as well, which appears to be caused by insufficient organizational learning. This shows again that trust is a necessary but not sufficient condition for effective and efficient organizational learning, as already proposed in Chapter 3.

Additionally, intensive training of employees can be useless for organizational learning when it has the wrong content (e.g., Uddevalla)



Simply too shallow a link of theory cars

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or happens without training of management in “soft skills”, such as communication and team work (e.g., Van-Nuys), that changes their attitude towards employees. This shows again that training is a necessary but not sufficient condition for effective and efficient organizational learning.

The last part of this chapter looks at the different theories which try to explain similar occurrences like the theory of organizational learning and the Learning Organization.

Why here? ? ? ?

#### 4.7. Overview of Overlapping Areas with Organizational Learning

As mentioned in Chapter 1, there is some literature which overlaps with the theory of organizational learning and the Learning Organization, as developed in this thesis. This is partially because these other models deal with the same phenomenon as part of this thesis does, i.e. what makes the competitiveness of Japanese production companies? The most significantly overlapping areas selected here are innovation theory as well as operations management, including just-in-time and total quality management, but also lean production, which deals extensively with the car industry.

##### 4.7.1. Innovation Theory

Innovation theory deals with innovation as a whole and starts with Schumpeter's innovation theory in 1908: the creative destruction in the market place by the dynamic entrepreneur as the driving force. This includes three different phases: firstly, the invention as the origination, secondly, the innovation as the first usage and, thirdly, the imitation as the diffusion stage of the invention (cf. Gabler Wirtschafts-Lexikon 1988: 1414 and 2564).

There is also some further work (Nelson & Winter 1977: 36-76, Dosi 1982: 147-62 and Dosi 1988: 221-38) available about a theory of innovation, which researches the nature of the innovation process. It tries to explain the innovation process with the help of macro-economical perspectives on trends and patterns of technical change.

However, innovation theory focuses explicitly on the innovation process and less on incremental improvements, as well as predominantly on the macro perspective of theory of economic change. Thus, innovation

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theory regards the innovation process very much as part of the development within an industry. *So?*

##### 4.7.2. Operations Management

As opposed to innovation theory, operations management looks at the micro-economic perspective of the firm, including its operations and increasing its efficiency, i.e. incremental improvements. Operations management, which deals with the management of throughput, the process between input and output of an organization, has recently also embraced total quality management and just-in-time management<sup>71</sup>, due to the relevance of both to current operations management (cf. Dilworth 1993, Finch & Luebbe 1995 and Russell & Taylor 1995).

Total quality management (TQM) is normally mentioned in conjunction with its most influential proponents, i.e. Deming, Juran and Crosby. Especially Deming's teaching to the Japanese industry in the 1950s is seen to be key for its latter's development. It included the "Deming Wheel" (also called the plan-do-check-act (PDCA) cycle as these are the four steps of the Deming Wheel, which can be repeated over and over again) as well as the Deming's overall 14 point philosophy for achieving improvements. The latter, despite a lack of theoretical underpinning, has many commonalities with the Learning Organization's characteristics (e.g., purpose towards product improvements, constant improvement of the production process, establishment of worker training, diminution of the fear of reprisal or promotion of co-operation and a team approach for working together). Other overlapping areas are quality circles, employee suggestions programs and ad-hoc teams for solving problems (cf. Dilworth 1993: 460-83, Finch & Luebbe 1995: 92-161 and Russell & Taylor 1995: 73-128). *why here? - check some previously*

Just-in-time (JIT) management deals with the finding that pull-delivery of components in small batches (also called "kanban" when empty containers are returned, being an order for a new delivery), only at the time when the components are needed in the production process, is designed to reduce waste and stock as well as to improve quality. Originating from Japan, especially Toyota with its proximity of suppliers

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<sup>71</sup> E.g., Finch & Luebbe 1995 call those two areas: "new direction in operations management."



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in Toyota City, it has been regarded as one of the major reasons for the Japanese global competitiveness in the 1980's (cf. Dilworth 1993: 340-65, Finch & Luebbe 1995: 162-91 and Russell & Taylor 1995: 711-42).

Mair (1992), however, argues that just-in-time management is dependent on a short distance between the plants. Thus, the inherited geography of the plant locations can be of advantage (as in Toyota's case with Toyota City where assembly plants and suppliers concentrate) or of disadvantage (as in Nissan's case with Tokyo, where the assembly plants are dispersed) for JIT. The inherited geography is suggested to be a major reason for the limited use of JIT by Mitsubishi and Mazda.

Elements of JIT and TQM appear again in lean production which will be dealt with in the next sub-section.

##### 4.7.3. Lean Production

The term "lean production" was coined by Krafcik in 1988, who found that lean production systems<sup>72</sup> conveyed various advantages over "buffered production systems", in terms of impact on operating performance, measured in levels of productivity, quality and model mix complexity.

However, only when Womack *et al.* published their successful and influential book "The Machine that Changed the World" two years later in 1990, within the framework of the IMVP<sup>73</sup>, they drew the attention of management as well as researchers in the Western world to the concept of lean production management. This should explain the international success of the Japanese automobile industry, with the Toyota Production System in focus. Womack *et al.* (1990) definition of lean production management comprises the endless quest for perfection with regards to continually declining costs, zero defects and zero inventory (through kaizen, just-in-

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<sup>72</sup> The variable "lean production system" was constructed from the four variables: (1) team work (degree of team work employed in the plant), (2) worker span of control (level of visual control), (3) unscheduled absenteeism (indicator of worker participation and management expectation) and (4) percentage of floorspace dedicated to repair facilities (indicator of management expectation about process capabilities) (Krafcik 1988: 52). However, it did not comprise the level of inventory, as one might have expected.

<sup>73</sup> IMVP stands for the International Motor Vehicle Program at the MIT (Massachusetts Institute of Technology), a large research project on the future of the automobile industry.

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time system and close supplier relationships), and endless product variety, as well as team work, in combination with delegating responsibility to the shop floor and flat hierarchies.

Hentze & Kammel (1992: 631-39) argue that the term “lean production” has the disadvantage that it does not directly indicate that an integrative concept is meant, which comprises the management at the whole value chain.<sup>74</sup> Furthermore, Hentze & Kammel argue that, from a critical-rational point of view, lean production is not satisfactory, as a data-oriented populist approach was preferred, which did not have a firm theoretical underpinning. *huh?*

There might be some strong criticism coming from people like Hentze & Kammel, *the* fact is that the concept of lean production played an important role in changing the old paradigm in the Western business world which believed in the superiority of Western mass production because it is based on economies of scale. Besides lean production, the paradigm of organizational learning and the Learning Organization also offers an explanation *to* why Western mass production failed to live up to its expectations, but it includes a coherent underling theory. *new style*

In addition, the paradigm of lean production showed some shortcoming in recent years, which the following three examples illustrate.

Firstly, the latest Toyota plant in Japan, built on the Island Kyushu in the early 1990s, does not pursue a pure lean production strategy anymore. The assembly line is split into mini conveyor belts, and there are buffer areas for up to five vehicles in between production islands and mini conveyor belts with assembly teams, called kumi. These teams can fix problems stopping their mini conveyor belt (which is normally done within 5 minutes in 95% of the cases) or perform kaizen activities (continuous improvement), without disrupting the overall assembly process, and then catch up again. Therefore, this new Kyushu production system is able to produce at the lowest defect rate of all Toyota plants, as well as with a higher productivity than comparable plants, but also makes shop floor work more attractive again by limiting the stress generated by the old

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<sup>74</sup> Womack & Jones try to address this shortcoming by repositioning and re-labelling “lean production” to “lean enterprise” (1994), and then “lean thinking” (1996).



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system (Shimizu 1994: 20-25 and N. A. A. (Automobil-Produktion) 1994: 110-12).

This means that a decrease of leanness here increases the aim of zero defects, and this is implemented by the “lean producer” Toyota. It is an occurrence which does not fit into the lean model paradigm anymore, as suggested by Womack *et al.* (1990). However, from the point of view of the Learning Organization it makes still sense, as Toyota has organizationally learnt to make a further step forward in the process of increasing efficiency and effectiveness of its production operation in Kyushu, but at the same time even making shop floor work more attractive within a tight labour market. poor style still shallow

Secondly, the fire at one of Toyota's low tech suppliers for key brake valves stopped the production of these parts on 1st February 1997. Without these parts, two plants that produce master brake cylinders and clutch master cylinders were forced to stop production. Due to the just-in-time system, this led to a production stop in all of 18 Toyota's Japanese assembly plants only three days later. In addition, as the kanban system was in use this led to a halt in production at all other suppliers for these Toyota assembly plants. Thus, the fire at one supplier led to a loss in production of 70,000 cars for Toyota, costing nearly US\$200m. Now, Toyota looks to at least double-source some components again, which were previously single-sourced (cf. Automotive News 3-3-1997).

This anecdotal evidence shows that single-source supply *per se*, as suggested by Womack *et al.* (1990), is not the only issue for the “lean producer” Toyota anymore. It makes more sense to say that Toyota learnt organizationally that the advantages of single-sourcing have to be carefully weighted against the risk of stopping the complete production in case of a hazard. So what?

Again, this case can be explained by the theory of organizational learning and the Learning Organization, but not anymore by the paradigm of lean production management. oh dear

Thirdly, as regards to product variety, the trend looks as follows for some Japanese producers in 1998: Nissan is in the process of reducing its model range from 50 to 40 models, Mazda stops the production of the Lantis and the Revue, and Toyota takes a similar step by merging the Camry with the Vista (Auto Zeitung 11-3-1998).



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

Again, as opposed to the view of Womack *et al.* (1990) that lean producers are very efficient in producing large model varieties, they appear to be doing the opposite by diminishing their model range. These Japanese manufacturers have learnt organizationally that, instead of increasing the model variety, diminishing it can sometimes have a more positive effect on the bottom line.

continuous  
shallow use of the  
vocabulary

In summary, it appears as if the paradigm of lean production is a collection of symptoms of a Japanese, especially Toyota, production system at the end of the 1980s. However, the focus on the leanness of the system alone has some disadvantages. As the three examples have shown, there are cases in the 1990s which cannot be explained by the lean production paradigm anymore. Additionally, lean production fails to acknowledge the fact that the existence of those kaizen teams (i.e. continuous improvement teams) is not lean, this especially applies to those which are only dealing with improvements of the system. They are rather the purposeful provision of non-lean slack (i.e. redundancy) in order to enable organizational learning.

##### 4.7.4. Conclusion of the Discussion of the Overlapping Areas:

##### Organizational Learning as a Meta-Theory

only by being so  
abstract!

All in all, lean production, operations management, and innovation theory offer different points of view on a similar topic, which is: why are some companies more competitive than others? As Japanese companies were perceived as being very competitive in the 1980s, they also are the focal point in many research studies. After the discussion of these models, it was shown that they overlap in some ways with the theory of organizational learning and the Learning Organization. All these overlapping areas deal with the question of how to structure an organization in a way to be more effective.

Organization?

Whereas innovation theory focuses predominantly on the efficient innovation process and operations management on the efficient production process, lean production tries to combine the two areas under a new paradigm of eliminating and avoiding waste.



#### 4. LEARNING HISTORY OF JAPAN AND THE JAPANESE CAR INDUSTRY

It has been shown in this thesis that these areas are covered by the theory of organizational learning and the Learning Organization, but it also provides an underlying coherent framework with its focus on organizational learning as a sort of meta-theory. It can also explain recent developments, especially in the Japanese car industry, which lean production cannot do anymore, due to the conceptual limitations of its paradigm. This is a further reason why it is worthwhile to explore the theory of organizational learning and the Learning Organization in more depth with the help of empirical research.

In summary, this chapter looked at the history of organizational learning and the Learning Organization of Japan, with special focus on the Japanese automobile industry. It showed that taking this theoretical perspective of the car industry can be very useful for analysis, and that the process of learning and teaching has not yet ended. Additionally, other overlapping areas of research with the theory of organizational learning and the Learning Organization were discussed, and it was shown that the latter can well serve as a meta-theory of the former.

The next chapter looks at the automobile industry in Great Britain, shifting the focus to the empirical side of this thesis.

## 5. Situation and Trend of the Car Industry in Great Britain

After this thesis had a more theoretical focus in Chapters 2 to 4, Chapters 5 to 9 have a more empirical focus. Chapters 5 and 6 set the scene for the empirical work, with Chapter 5 dealing with the research subject and Chapter 6 dealing with the research methodology. The latter also concludes the development of the two main hypotheses.

This chapter presents a snapshot of the current situation and trend in the global and Western European car industry with a focus on Great Britain, as this will be the focal point of the empirical research. British car production has undergone a significant change since the beginning of the 1990s, as there is a growing presence of Japanese car assemblers and Japanese car component suppliers in the UK. As some of the former are classified as Learning Organizations in current literature (see Chapter 4), the transfer of this knowledge to direct car component suppliers in Britain is researched. This positive impact is the core of Hypothesis 2. by whom?

### 5.1. Car Sales and Production in the World, Western Europe and Britain

This section deals first with car sales and then with car production world-wide, focusing on Western Europe and in particular Great Britain. why?

#### 5.1.1. Car Sales in the World, Western Europe and Britain

World-wide car sales amounted to 37.4m units in 1997, which represents an increase of more than 13% compared to 1993. However, 1993 was a weak year, hit by an economic recession.

About one third of car sales world-wide are transacted in Western Europe. This is an important share in a global market, and according to the forecast of the Global Automotive Group of Standard & Poor's DRI (1998), the proportion of car sales in Western Europe will stay about the same until 2001.

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Table 5.1: Car Sales in Western Europe, NAFTA<sup>75</sup>, Japan & World-Wide (in 000's, 1993 to 1997 actuals, 1998 to 2001 forecast)**

Region	Country	1993	1994	1995	1996	1997	1998	1999	2000	2001
W.Europe	Austria	285	274	280	308	276	282	294	295	293
	Belgium	417	417	386	427	428	435	441	443	458
	Denmark	84	140	136	142	151	130	132	136	141
	Eire	64	80	87	115	137	103	96	107	112
	Finland	56	67	80	96	105	111	122	132	141
	France	1,721	1,973	1,930	2,132	1,713	1,883	2,000	2,091	2,154
	Germany	3,194	3,209	3,314	3,496	3,528	3,677	3,753	3,800	3,878
	Greece	148	110	125	143	160	181	182	191	203
	Italy	1,694	1,686	1,738	1,732	2,412	2,059	1,788	1,976	2,103
	Netherlands	392	434	446	473	478	490	488	478	471
	Norway	61	85	91	125	128	117	125	131	136
	Portugal	243	233	201	218	213	237	261	264	275
	Spain	744	908	834	911	1,014	1,045	1,081	1,085	1,073
	Sweden	124	156	170	184	225	243	247	236	231
	Switzerland	259	266	268	272	275	291	297	291	291
	UK	1,778	1,911	1,945	2,025	2,171	2,201	2,118	2,039	2,106
<b>W.Europe Total</b>		<b>11,263</b>	<b>11,949</b>	<b>12,032</b>	<b>12,800</b>	<b>13,413</b>	<b>13,486</b>	<b>13,426</b>	<b>13,694</b>	<b>14,067</b>
NAFTA	Canada	739	747	681	661	739	763	719	731	728
	Mexico	399	411	142	197	268	405	420	452	445
	USA	8,502	8,981	8,631	8,526	8,272	8,078	7,972	7,767	7,609
<b>NAFTA Total</b>		<b>9,640</b>	<b>10,139</b>	<b>9,454</b>	<b>9,383</b>	<b>9,279</b>	<b>9,246</b>	<b>9,111</b>	<b>8,951</b>	<b>8,782</b>
Asia	Japan	4,199	4,210	4,444	4,669	4,492	4,398	4,552	4,653	4,605
<b>World Total</b>		<b>32,980</b>	<b>34,643</b>	<b>34,808</b>	<b>36,381</b>	<b>37,443</b>	<b>37,124</b>	<b>37,405</b>	<b>38,379</b>	<b>39,267</b>

Source: Global Automotive Group of Standard & Poor's DRI 1988: 17.

The next sub-section looks at the corresponding car production.

### 5.1.2. Car Production in the World, Western Europe and Britain

Similarly to car sales, according to the Global Automotive Group of Standard & Poor's DRI (1998), about one third of all car production world-wide originates in Western Europe (see Table 5.2).

<sup>75</sup> NAFTA is the North American Free Trade Agreement between the US, Canada and Mexico.



## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Table 5.2:** Car Production in Western Europe, NAFTA, Japan & World-Wide (in 000's, 1993 to 1997 actuals, 1998 to 2001 forecast)

Region	Country	1993	1994	1995	1996	1997	1998	1999	2000	2001
W.Europe	Austria	41	45	58	97	90	86	97	103	99
	Belgium	347	408	386	368	360	337	304	288	363
	France	2,836	3,175	3,051	3,148	3,346	3,381	3,264	3,185	3,303
	Germany	3,794	4,094	4,360	4,540	4,678	5,000	5,133	5,085	5,106
	Italy	1,117	1,341	1,422	1,318	1,563	1,430	1,292	1,387	1,398
	Netherlands	80	92	100	147	197	224	257	243	244
	Portugal	0	0	41	119	130	125	118	115	103
	Spain	1,506	1,822	1,959	1,942	1,990	1,899	1,873	1,851	1,892
	Sweden	279	354	388	370	376	393	444	459	451
	UK	1,376	1,467	1,532	1,686	1,698	1,764	1,820	1,858	1,899
	Double Count	-531	-687	-686	-669	-638	-641	-657	-657	-657
<b>W.Europe Total</b>		<b>10,845</b>	<b>12,110</b>	<b>12,612</b>	<b>13,063</b>	<b>13,790</b>	<b>13,998</b>	<b>13,945</b>	<b>13,917</b>	<b>14,199</b>
NAFTA	Canada	1,353	1,216	1,337	1,280	1,372	1,483	1,458	1,420	1,413
	Mexico	835	857	699	800	842	811	922	954	989
	USA	5,982	6,601	6,340	6,083	5,912	5,806	5,752	5,674	5,547
<b>NAFTA Total</b>		<b>8,170</b>	<b>8,674</b>	<b>8,376</b>	<b>8,163</b>	<b>8,127</b>	<b>8,100</b>	<b>8,132</b>	<b>8,048</b>	<b>7,948</b>
Asia	Japan	8,499	7,801	7,611	7,864	8,492	8,215	8,155	7,887	7,914
<b>World Total</b>		<b>33,689</b>	<b>34,902</b>	<b>35,455</b>	<b>36,692</b>	<b>38,870</b>	<b>38,564</b>	<b>39,154</b>	<b>39,545</b>	<b>40,522</b>

Source: Global Automotive Group of Standard & Poor's DRI 1998: 20.

The figures above show that Western Europe has played and will continue to play an important role in the global car market and industry.

The next section focuses on Japanese car sales and production in Western Europe.

### 5.2. Japanese Car Sales and Production in Western Europe and Britain

According to Mair (1994: 219f), the attitude towards Japanese car manufacturers in Western Europe differs strongly from country to country, which has led to diverging policies. Southern European countries have a strong tradition of protecting their markets (Spain: SEAT, Italy: FIAT and France: Renault and PSA (i.e. Peugeot and Citroen) [examples are provided by the author of this thesis]). Other countries, in particular Germany (because of a heavily export-oriented car industry) and Denmark (no car industry at all), have a more liberal approach. This difference in

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

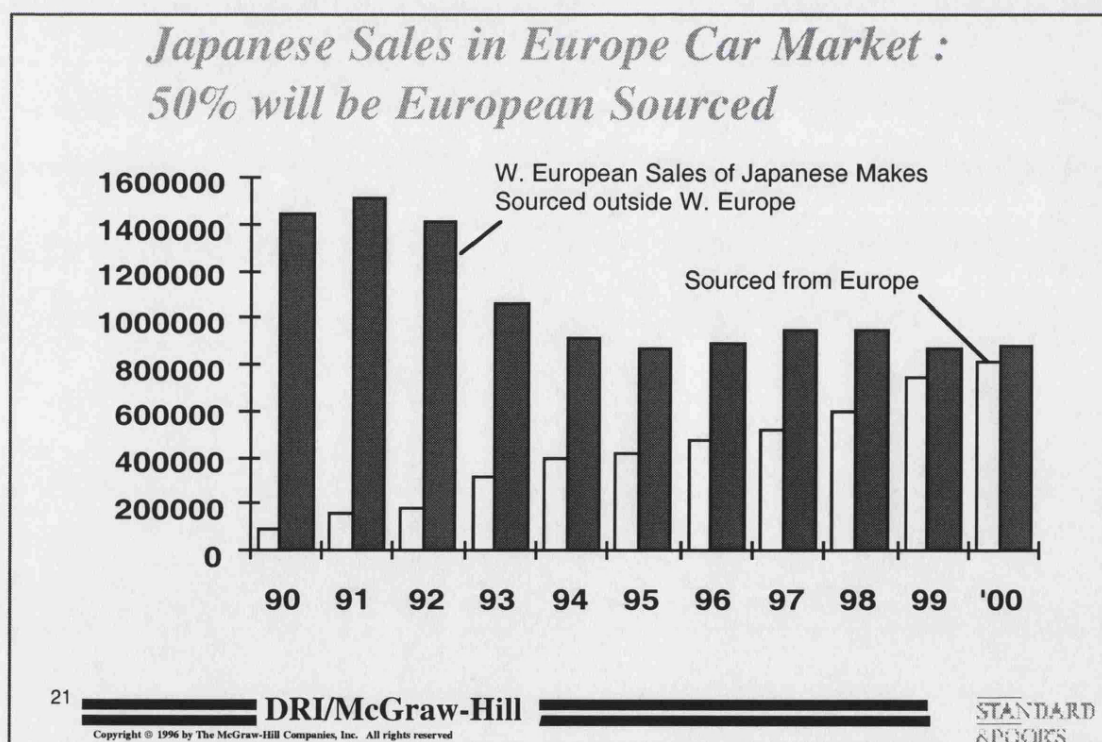
national policies explains a lot of the divergence in Japanese sales across Western Europe.

“The average Japanese car market share in Western Europe stood at 12 per cent in the early 1990s, compared to 30 per cent in North America” (Mair 1994: 221).

The European Commission tried to avoid a similar high market share in Western Europe and, therefore, in 1991 self-limiting treaties with Japan were signed, in order to protect the car production in the European Union and limit the Japanese import market share to 16%.

This, however, fluctuated around 10% in 1996 and the strong yen encouraged Japanese production inside Western Europe, as imports from Japan became increasingly expensive. And with 808,000 imported Japanese cars in 1996, only 75% of the “voluntarily agreed limit” between the EU and Japan was reached (FAZ 2-4-1997).

Figure 5.1: Japanese Car Sales and Production in Western Europe



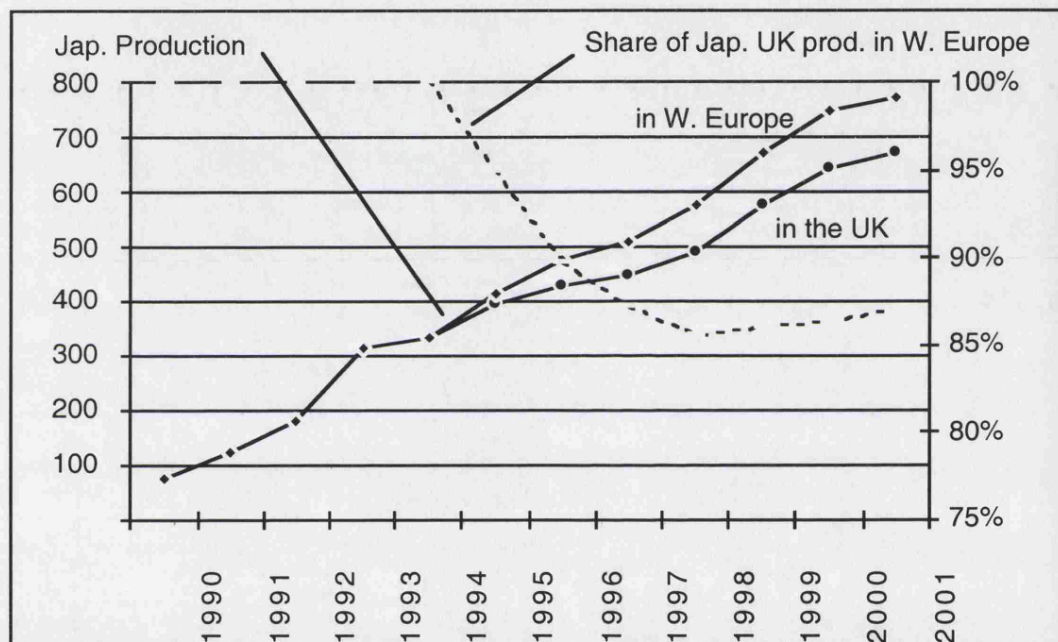
Source: Griffiths (DRI) 1996: 11.

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

Griffiths (1996: 11) expects that in 2000 nearly 50% of Japanese cars sold in Western Europe will have been produced in Western Europe (see Figure 5.1).

Japanese car assembly in Western Europe has been to date and will in the future be primarily focused on Great Britain, with a share of about 90% in 1996 (see Figure 5.2). This share, which was even higher in the past, shows that the UK is the best location in Western Europe to analyse the impact of the Japanese car assemblers on car component suppliers.

**Figure 5.2:** Japanese Car Production in W. Europe and the UK (in 000's)



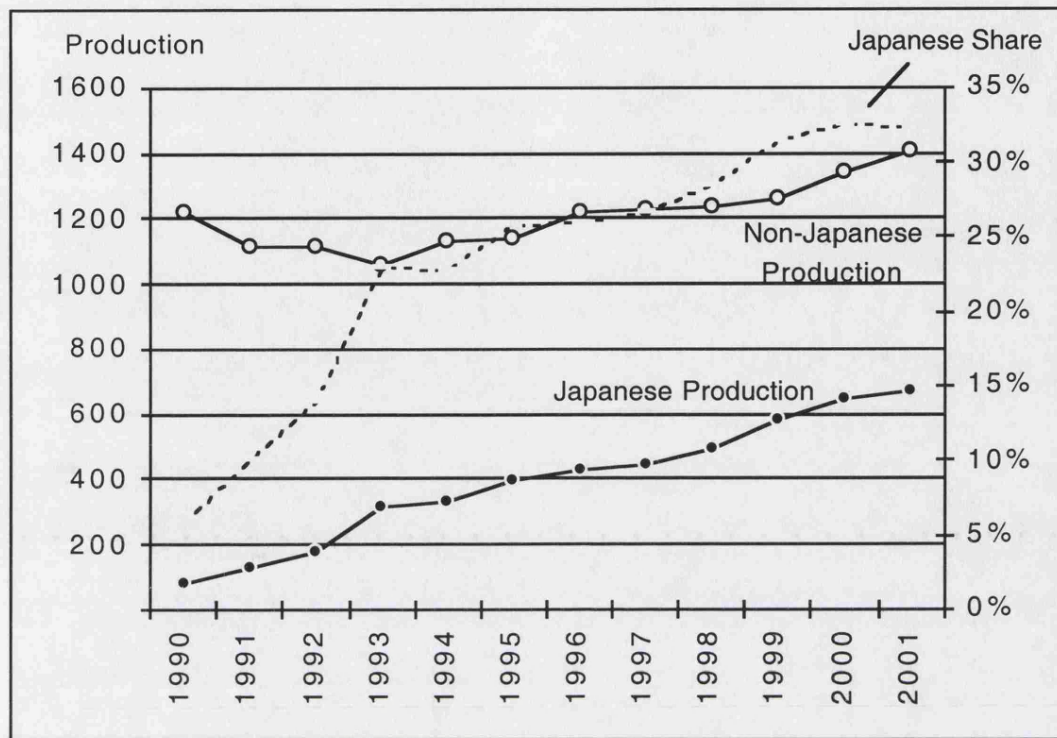
Source: DRI's Global Automotive Group 1996, author's own calculations.

Since the start of production in 1990, the Japanese share of car production in Great Britain has risen continuously, reaching 26% in 1995 (see Figure 5.3). This has helped to offset the declining production of non-Japanese makes in the UK, and has led to an overall growth in car assembly.



## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Figure 5.3:** Japanese and Non-Japanese Car Production in the UK (000's)



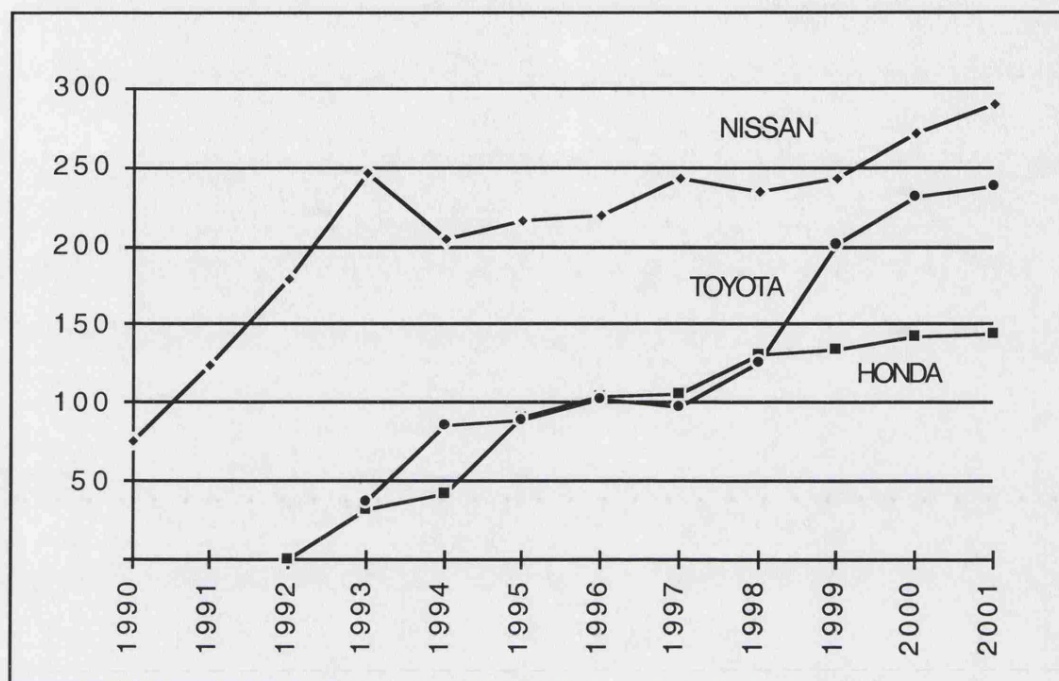
Source: DRI's Global Automotive Group 1996, author's own calculations.

Taking a closer look at the start of Japanese car production in Britain, Nissan started production in 1986 (Nissan Primera and Bluebird), Honda in 1992 (Honda Accord) and Toyota in 1993 (Toyota Carina) (Lamming 1993: 21 and Shimokawa 1994: 151).

Figure 5.4 shows that Nissan started with a clear lead, but suffered from the recession in 1993, leading to falling production numbers in 1994. However, in absolute numbers, Nissan is still the largest Japanese car producer in Great Britain. Honda's long established co-operative relationship with Rover led to sufficient knowledge acquisition so that Honda could start production on its own in 1992. Toyota's production start in Britain followed one year later.

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Figure 5.4:** Japanese Car Production in the UK by Manufacturer  
(in 000's, 1991 to 1995 actuals, forecast 1996 to 2001)



Source: DRI's Global Automotive Group 1996, author's own calculations.

This production trend has some impact on the car component suppliers of these Japanese assembly plants. As the majority of Japanese car plants in Western Europe are in Britain (cf. also Lamming 1993: 21), this thesis will focus on the car components suppliers in Great Britain, in order to investigate the process of organizational learning of these suppliers from Japanese car producers.

Thus, the next chapter will elicit the situation of those car component suppliers in Great Britain who deliver to Japanese car assemblers.

### 5.3. Situation of the Automotive Component Suppliers in Britain

Due to vast direct investments by Japanese car producers and some of their suppliers in Western Europe, especially in Britain, the situation of British suppliers to the automobile industry has changed dramatically in recent years.



## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

These direct investments were triggered by trade frictions and import restrictions of the European Community (EC), as well as the appreciation of the Yen. The production facilities were generally located in Britain; the reasons for this were as follows (Fujimoto *et al.* 1994: 372, Fujimoto *et al.* 1994a: 5 and cf. also Truesdale & Carr 1991: 3):

- government and regional incentives,
- comparatively low wages in Western Europe (i.e. Germany and France),
- the Anglo-American business atmosphere (transferable US experience),
- language familiarity (English), and
- access to the entire EC market.

Additionally, the historic ties, derived from licensing of British car patents by Japanese car producers, were an important reason as well.

Lamming (1993: 20f and 263-8) observes that Japanese component suppliers established themselves in Britain either by founding a new company or by entering into a joint-venture, starting with Yuasa Battery in 1981. Of the Japanese car assemblers which came to Britain to found their own production companies, Nissan was first in 1984.

For car component suppliers in Britain, Japanese car assemblers represented, on the one hand, an opportunity to gain new customers (FT (5) 28-6-1993 and FT (9) 28-6-1993). On the other hand, it was not easy to fulfil the quality standards required by the Japanese car producers and to survive against the new Japanese competition (FT 14-7-1992).

Truesdale & Carr (1991: 1) are convinced that "Japanese car makers in the United Kingdom want to establish a close, long-term relationship with their suppliers, similar to relationships in Japan."

The relevant number of British suppliers to the automobile industry is about 300 major companies and 1,500 minor companies (Lamming 1989: 13, cf. also Lamming 1993: 46). As regards to number of large suppliers, Britain is third after West Germany and France in Western Europe (see Table 5.3).

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## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Table 5.3: Numbers of Automotive Component Suppliers in W. Europe**

	<b>Major</b>	<b>Minor</b>
West Germany	450	5,000
France	400	1,500
UK	300	1,500
Italy	250	1,000
Spain	50	500
Others	50	500
<b>Total</b>	<b>1,500</b>	<b>10,000</b>

Source: Lamming 1989: 13.

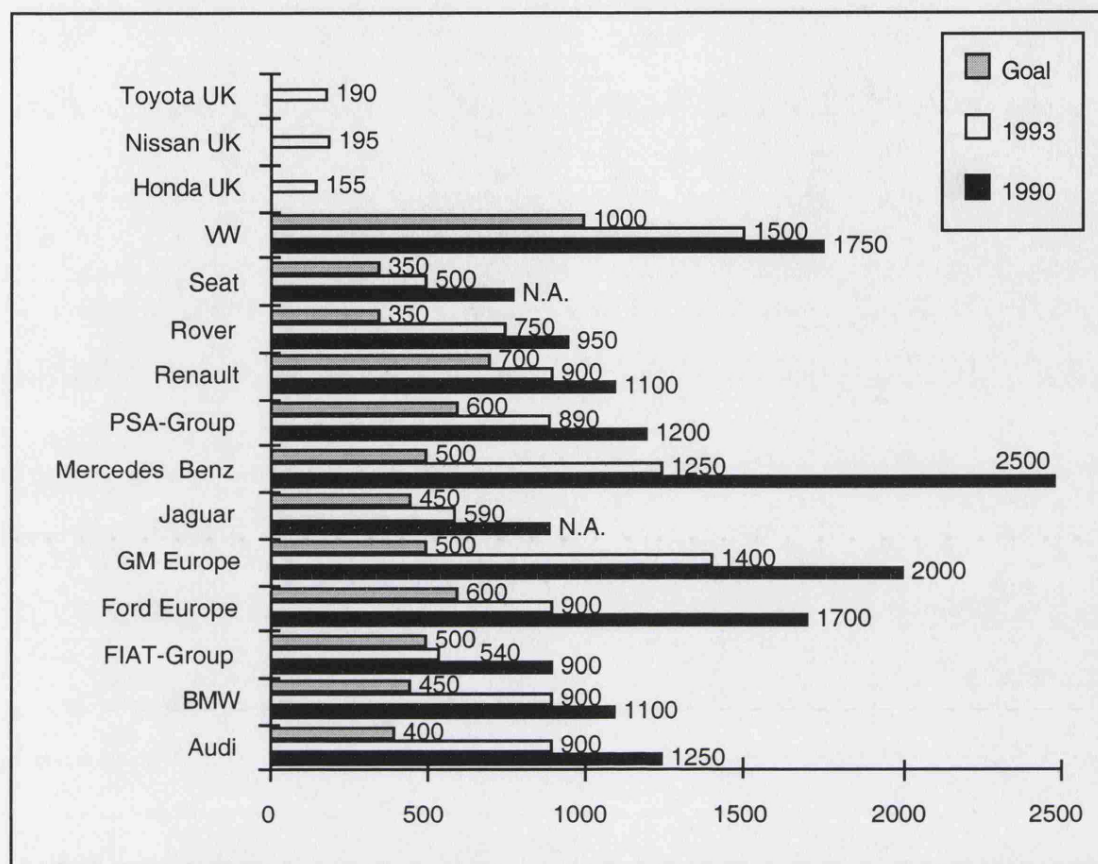
The Boston Consulting Group & PRS Consulting (1991: 6) compiled a list of only 350 suppliers in the UK, which, however, seems to include only major components suppliers.

Wolters (1994: 23) has tried to assess the number of direct suppliers to a selection of major Western European car companies, indicating a general trend of declining numbers, which is shown in Figure 5.5.

However, not all direct suppliers to a car manufacturer in Britain are located in Britain. Thus, they can also be located elsewhere in Western Europe, or even in the world. Additionally, as the same suppliers deliver to various manufacturers, calculating the number of direct suppliers in the UK by adding these numbers would lead to double counting.

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

**Figure 5.5:** Number of Selected Car Producer's Suppliers in W. Europe



Source: Wolters 1994: 23.

Unfortunately, current literature at the time of the questionnaire research in 1995 did not distinguish whether car component producers supply car assemblers in Western Europe directly or indirectly. Additionally, there was no indication as to in which country component suppliers produce their products.

In 1995, even The Society of Motor Manufacturers and Traders (SMMT), which represents the car assemblers and component suppliers in Britain, could not give an accurate answer to the question of the number of direct suppliers which produce their car components in Britain. Thus, their total number could not be accurately assessed.

Still, this was not the key issue of this thesis. Instead, the thesis focuses on a comprehensive understanding of the impact of Japanese companies in

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

the car industry, in particular Japanese car assemblers in the United Kingdom, on car component suppliers in Great Britain.

However, in 1998, the SMMT started to publish "The UK Motor Industry Directory 1998", which had sufficient information to identify roughly 400 major and minor car component producers assembling in Britain and directly supplying to car manufacturers. This number is considerably lower than the original sample of this thesis, because supplier of machinery and software as well as of engineering and prototyping could be excluded this time, both not being car component suppliers and thus not the research target of the questionnaire.

Oliver *et al.* (1996: 29-44 and 1996a: 85-97) have tried to make a global assessment of the differences in lean production in the car component industry with special focus on the UK. Both papers are based on a study from 1994<sup>76</sup>, which comprises the analysis of 71 automotive component plants, of which 12 plants were located in the UK. From this sample they draw conclusions on the state of the car component industry in the UK.

"Leanness" of a plant was measured by Oliver *et al.* (1996: 32) with the help of *plant performance* (units per labour hour), *quality* (defective parts reported by customers), *management practice* (hours of plant inventories and rework, less of both also means lower costs), *production teams and their amount of responsibly* (e.g., areas), *continuous improvement activities* (suggestion schemes, number of suggestions and activity of problem solving groups) as well as *human resource policies* (questions for "certain 'high commitment' human-resource policies" (Oliver *et al.* 1996: 32), which were, however, not specified in more detail). Sometimes these areas were extended to assess leanness of the customer and supplier relationships of the plants, e.g. inventories of raw materials and finished goods.

In summary, Oliver *et al.* (1996: 29-44 and 1996a: 85-97) give an interesting insight into the use of lean production on the supplier level.

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<sup>76</sup> Oliver *et al.* also participated in the study which was published as the "Worldwide Manufacturing Competitiveness Study - The Second Lean Enterprise Report" (Andersen Consulting 1994). This study was preceded by another study called "The Lean Enterprise Benchmarking Project" (Andersen Consulting 1992), which compared 9 auto component plants each in the UK and Japan.



## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

However, they admit that they were not able to show a clear link between team work, operator responsibility, problem-solving as well as visual control and performance.

This again gives the impression that the model of lean production is more a collection of symptoms than a coherent theory, as it has been discussed in Chapter 4.

In addition, Oliver *et al.* leave some interesting questions open, which will addressed be later on in this thesis. For example, an analysis of how car component suppliers in the UK adopt lean techniques and adapt these for their own needs, might have been useful. However, due to the low number of companies assessed this would have been hardly possible. Furthermore, where have UK suppliers acquired their knowledge about lean production from. If this knowledge was acquired from Japanese car companies, are there any differences between the various manufacturers, and how has this the knowledge been transferred?

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When Honda, for example, established production in Great Britain, it announced that a high share of components would be sourced locally. The British government ensured that Honda is kept to the agreed share of European locally components and helped Honda to keep other Western European markets open for its exports from the United Kingdom (Mair 1994: 343). And by 1992, when production of the Honda Accord began, more than 100 component producers based in the United Kingdom had been assigned by Honda (Mair 1994: 264).

Nissan's approach in Great Britain has been characterised by its suppliers as follows (Truesdale & Carr 1991: 17): "Firstly, the emphasis is always on trying to improve, rather than 'relaxing' when a standard is achieved. The informal, flexible Nissan approach is contrasted with the 'mechanistic' systems approach of other car makers." It should be noted that theses aspects are similar to "continuous improvement of work" and "flexibility of strategy and employees", which are both characteristics of the Learning Organization. Furthermore, Truesdale & Carr (1991: 20) also indicate a trend towards an "open style of management" at these suppliers, reflecting and reinforcing team work, communication and common decision making.

Toyota has been concerned to establish stable, long-term supplier relationship and also intends to help its components makers in Europe:

## 5. SITUATION AND TREND OF THE CAR INDUSTRY IN GREAT BRITAIN

“Specific advice has also been provided in quality control - building quality into the process - the introduction of “Kaizen” continuous improvement methods and training in Japan on all aspects of the Toyota Production System” (Toyota 1994).

To summarize, this chapter explains why Britain is an interesting location in Western Europe for empirical research into the organizational learning of direct car components suppliers in the UK from Japanese companies in the car industry, which can be car producers or car component suppliers.

In order to research what component suppliers in Great Britain have really learnt from Japanese car companies, the next chapter will develop the approach of the empirical analysis of this thesis.



## 6. Research Methodology and Model

This sixth chapter discusses and completes the conceptual framework (including the operationalization<sup>77</sup> of the two main hypothesis) used for the empirical research of this thesis, which is presented in Chapters 7, 8 and 9.

The chapter starts with a detailed analysis of the limited amount of empirical work that is currently available on the Learning Organization and organizational learning in general, which proved to be of little help for this thesis. Then, the selection of the empirical research philosophy (phenomenology) and method (cross-sectional study) is discussed, as well as the empirical research procedure, which consists of three different steps: exploratory interviews (Chapter 7), questionnaire survey (Chapter 8) and in-depth interviews (Chapter 9).

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### 6.1. Empirical Studies on Organizational Learning and Learning Organizations in Existing Literature

It has been suggested in Chapter 3 that certain characteristics of the Learning Organization influence organizational learning within an organization, and also amongst different organizations. Both in turn have an impact on the organizational learning outcomes. In this section the operationalization of the characteristics of the Learning Organization and their implications will be considered in terms of the questions for the questionnaire.

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The problem arising for this thesis is that, on the one hand, the dominant share of literature on organizational learning is normative and, therefore, not easy to operationalize. On the other hand, empirical work which used questionnaire-based research is scarce.

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and some? At the time of developing the empirical framework for this thesis, there were only four empirical studies available, which tried to grasp Learning Organizations and/or organizational learning in reality. These are studies by (1) Shrivastava (1983), (2) Ulrich *et al.* (1993), (3) Inkpen

<sup>77</sup> Operationalization is the transformation of a theory so that it can be used for empirical research.



(1992) and (4) Dierkes & Raske (1994 and 1994a), which are now discussed.

### 6.1.1. Study by Shrivastava

The empirical work of Shrivastava's paper (1983: 7-28) is based on the research for his unpublished thesis in 1981. He took account of 32 different businesses and clustered them according to two dimensions. The first is the **individual-organizational dimension**, which ranges from an individual-dependent system to a learning system that is impersonal and independent of individuals. The second is the **evolutionary-design dimension**, which ranges from learning when not consciously making an effort to design learning mechanisms and the implementation of learning instruments by management.

He identified six different types of learning systems (see Figure 6.1), in order to develop a typology of organizational learning systems.

(A) *One man institutions* have one single person acting as the central point of knowledge acquisition, evaluation and dissemination. Thus, this person is central to organizational learning for this institution.

(B) *Mythological learning systems* exist where organizational learning takes place through stories, actors or activities. Thus, myths are generated that are the basis for norms for organizational learning.

(C) *Information seeking cultures* foster a culture of inquisitiveness and curiosity for information. They also give easy access to all information available and promote communication.

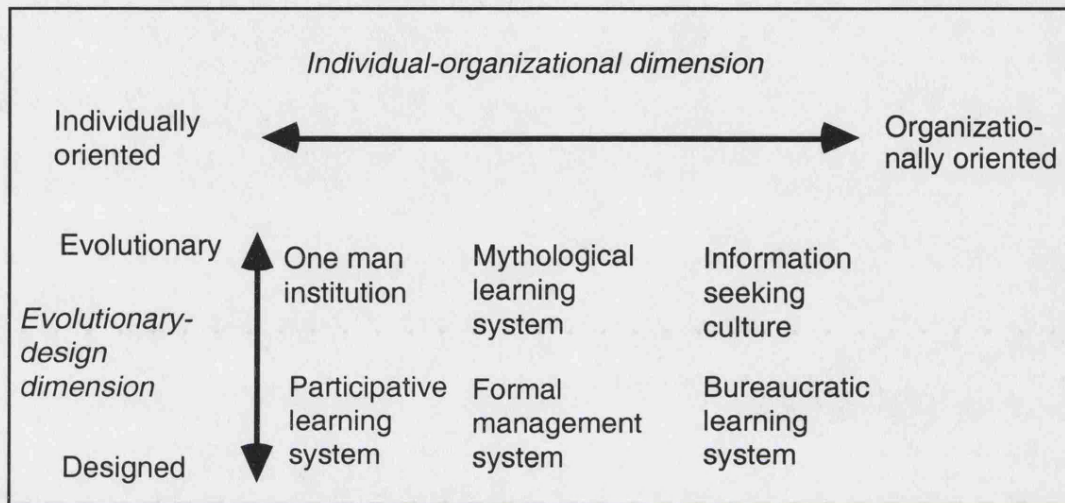
(D) *Participative learning systems* are based on a system of flexible groups and teams, which are created to solve major problems with the help of a participative process. The acquisition, processing and transfer of information is done by teams and groups as well as informal inter-personal communication.

(E) *Formal management systems* are learning systems that provide information, planning and control for organizational learning. Established systematic procedures not only incorporate knowledge gained from a single person's experience, but also employ standardized management techniques.

(F) *Bureaucratic learning systems* include a system of rules and regulations that guide exactly what kind of information goes to whom and

for what purpose. The system tries to be objective and impersonal, and the decision-making process has to follow detailed procedures that are featured in guidelines.

**Figure 6.1:** A Typology of Organizational Learning Systems



Source: Shrivastava 1983: 18.

It is not easy to decide whether an organizational learning system has been developed by evolution or by design, as it often is a mixture of both. Furthermore, six types of Learning Organizations are slightly confusing, especially because there are more different dimensions included in the model than explicitly stated. For instance, one man institutions can be organizationally oriented in the same way as an information-seeking culture can be individually oriented. Lastly, mythological learning seems to be a part of every learning system.

Summing up, Shrivastava delivers a typology of different organizational learning systems in order to get a more concise view of organizational learning systems, which is a mere clustering of organizations. Therefore, he does not suggest why (learning triggers) and how (learning amplifiers and obstacles) organizational learning occurs, and at what level (single-loop, double-loop or deuterio-learning).

*more simple categories!*

## 6. RESEARCH METHODOLOGY AND MODEL

### 6.1.2. Study by Ulrich *et al.*

Ulrich *et al.* (1993: 52-66) cluster their research sample in a similar way, focusing on an evaluation of the different groups. A world-wide qualitative study is undertaken on the difference that organizational learning makes as **ideas generating strategies**. A sample of 380 companies is used.

The paper starts with the question of learning capability as an ability to transfer new knowledge beyond boundaries. The study shows that learning capability and Learning Organizations are a part of the evolution of management thinking in the 1990s. There is also an overview of the different possibilities of how organizational capabilities can look like (see Figure 6.2).

*style*

**Figure 6.2:** Integrating Change Initiative, Learning Organization and Culture Change

Extent to which change initiative is adopted	high	2 change initiatives variations experimentation	4 cultural change through learning capability
	low	1 status quo	3 blind variation individual learning
		low	high
		Extent to which learning organization exists	

Source: Ulrich *et al.* 1993: 59.

The two dimensions are the *extent to which change initiative is adopted* and the *extent to which a learning organization exists*.

In cell 1 organizations focus on the status quo. Organizations in cell 2 are in a series of change initiatives, but fail to change. In cell 3 organizations learn without change. This can happen in two ways:



## 6. RESEARCH METHODOLOGY AND MODEL

individuals learn but not the organization, or units of the organizations experiment but fail to share their knowledge across boundaries. Organizations in cell 4 both change and learn, which is the aim management should strive for, according to Ulrich *et al.* That means they possess learning capability in terms of the *capacity to generate and generalize ideas with impact*. The generalization can only be accomplished by penetrating boundaries, such as time, vertical, horizontal, external and geographic boundaries.

For Ulrich *et al.* (1993: 60-66) the two main reasons for management's failure to create a Learning Organization are (1) "generation without generalization", i.e. no sharing across boundaries, and (2) "ideas without impact", i.e. even if ideas have been generalized they do not improve companies' competitiveness. However, it is not clear whether Ulrich *et al.* gained this insight from their questionnaire-based research or not.

In order to enable the capability to learn Ulrich *et al.* advocate three steps for management:

Firstly, management should *build a commitment of all employees to develop the capability to learn*. This includes making learning a visible and strategic intent; investing in learning; talking publicly about learning; the measuring, benchmarking and tracking of learning; and creating symbols of learning (e.g., an award for excellent learning performance or setting a personal example of learning).

Secondly, management should work to *generate ideas with impact*. From the their survey data collected, Ulrich *et al.* could identify four different ways how organizations generate ideas: (1) Continuous improvement is a way of making things better, (2) competence acquisition is a way of buying in knowledge, (3) experimentation is a way of trying out new ways and (4) boundary spanning is a way of adapting knowledge of other organizations to their own needs. These four different ways to create new knowledge indicate that there is a great variety generating new ideas.

However, the rigidity of clustering (i.e. grouping) of the companies in the survey, the attributes which defined these clusters and the companies provided as an example by Ulrich *et al.* appear to be slightly misleading

The rigidity of four clusters according to one dominant learning strategy each hides the fact that companies can also employ a combination

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of different strategies of knowledge generation at one single point of time. Furthermore, the items for constructing of the clusters are not explained. It is also unclear how “competitiveness” is defined by Ulrich *et al.*, which correlates positively with the capability to change and the use of experimentation as the dominant learning type. Ulrich *et al.* come to the conclusion that those companies that have the highest capability to change are the most competitive. To underline this finding, GM is given as an example with its two subsidiaries NUMMI and Saturn. However, automotive experts would not judge GM and Saturn to be very competitive, and NUMMI’s success is mostly due to Toyota and not to GM (cf. Adler 1993: 97-108, Adler & Cole 1993: 85-94, Mahoney & Deckop 1993: 27-38 and Ingrassia & White 1994).

Thirdly, Ulrich *et al.* suggest that management should strive to *generalize ideas with impact*. The creation of an infrastructure that moves knowledge across boundaries is characterised by a culture of shared mindset, competence (staffing, training/ development), consequence (appraising, rewards), governance (organization, design and communication), capacity for change through work process and system (change initiatives, work processes and systems) and leadership (demonstration of learning commitment).

However, apart from the “shared mindset”, an advice for a culture of open communication and trust is totally missing from the recommendations of Ulrich *et al.*. However, for the “empowerment of the employees” suggested, a culture of open communication and trust are vital. They are important as they encourage employees to share their ideas, as Chapter 3 and Chapter 4.6. show.

It was not possible to use Ulrich *et al.*’s questionnaire<sup>78</sup> for the research of this thesis because their investigation only focuses on qualitative evaluation of information gathering strategies and the clustering of these, whereas this thesis focuses on the characteristics, outcomes and sources of the Learning Organization.

<sup>78</sup> Dave Ulrich kindly sent a copy of the questionnaire to the author, which is gratefully acknowledged.

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### 6.1.3. Study by Inkpen

The third empirical work on organizational learning and the Learning Organizations is a Ph. D. thesis by Inkpen (1992), which looks at the learning of 40 North American and Japanese joint ventures in the automobile supply industry. He, therefore, focuses on only one special case of inter-organizational learning (i.e. joint ventures) and, in addition, restricts his point of view only to learning from a managerial perspective.

Inkpen's study suggests three findings: Firstly, in most cases learning was a joint venture motive, though not the most important one. Secondly, those parent companies which Inkpen classified as Learning Organizations had a management which recognised the existence of learning opportunities, and made serious efforts to transfer knowledge from the joint venture to the parent company. Thirdly, the intention to learn, i.e. "learning intent", was clearly associated with the initiation of learning efforts. However, there was a weak relationship between learning intent and the learning outcome, which Inkpen explains by the influence of unrealistic or inaccurate learning expectations.

Inkpen's (1992) investigation of joint ventures was of limited value for this thesis due to its specific nature and the fact that the questionnaire focused only on the learning of different departments in the companies analysed. In addition, Inkpen does not deal with characteristics of the Learning Organization, which play a pivotal role in this thesis. Furthermore, Inkpen only uses a very subjective indicator for learning outcome, i.e. asking in his questionnaire whether the experience of joint venture learning was useful. He admits that the "measures of learning variables were less than ideal" (Inkpen 1992: 236). Nevertheless, Inkpen's work can be useful further reading for those interested in an in-depth analysis of joint ventures as a special case of inter-organizational learning.

### 6.1.4. Study by Dierkes & Raske

The fourth and last empirical study by Dierkes & Raske (1994: 140-54, cf. also 1994a: 8-10) looks at the change processes of 40 large German-based companies. Although these companies were selected randomly, the authors judge them to be representative for larger groups of companies from different sectors in Germany. The companies are clustered into two



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groups, which are called *hierarchical* and *decentral organizations*<sup>79</sup> (hybrid structures are observed as well in their empirical work).

**Hierarchical organizations** are depicted as follows:

The top management keeps contact with the outside world. Competencies are well defined. The relationship between management and employees is patriarchal. Communication is effected via newsletter. Flows of information are only one way, i.e. top-down. After reaching a goal the status quo is preserved. Corporate strategy does not set future trends. Cultural values are: solvency, stability, “uprightness”, being long-established, reliable and trustworthy.

Dierkes & Raske see the dangers with this kind of organization that good ideas of employees peter out and warning signals are only taken seriously when top management perceives them.

**Decentral organizations** are characterised as follows:

Everybody in the organization has contact with the outside world. Responsibility is vastly delegated. Top management sees itself as a partner of the employees. Communication is direct within meetings or informal. The aim is continuous improvement. Corporate identity tends to set future trends. Cultural values are: openness, team orientation, creativity, flexibility, mistake tolerance and ambition.

Dierkes & Raske see the dangers of this type of organization to be the time-consuming process of continuous consultation, that ideas grow to be occasionally overvalued or that synergy effects are not used at all.

The research from Dierkes & Raske (1994a: 10) further identifies four different obstacles to change: Firstly, success is a major barrier, especially for hierarchical organizations. Secondly, employees’ limited ability and unwillingness to change is another obstacle, which is rooted in a deep fear of losing power or even the job. Thirdly, the lack of usability of employees and managers for change. The fourth and last obstacle is the difference between generations (i.e. younger and older employees), which is exacerbated by the difference between leavers and the newcomers.

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<sup>79</sup> Hierarchical organizations resemble Bureaucratic-Tayloristic Organizations and decentral organizations resemble Learning Organization (see Chapter 3), but Dierkes & Raske fail to quote any literature.

## 6. RESEARCH METHODOLOGY AND MODEL

Dierkes & Raske identify three driving forces of change: (1) involvement of more representatives of top management, (2) crises or (3) unexpected success in the market, in a number of limited cases.

The authors use company age as an indicator for successful change learning (i.e. the older a company the more successful its ability to change) and then conclude that company age makes no difference in showing successful change capability. However, they do not suggest any logical argument to validate their choice and conclusion or posit any theoretical construct. For example, other indicators for successful change learning could have been the pace of change or the rate of successful implementation of change programmes.

They neither give any indication of which type of organization is dominant in which industry. Based on the discussion at the end of Chapter 3.1., Bureaucratic-Tayloristic Organizations appear to be similar to hierarchical organizations and are adequate for stable environments. In contrast, Learning Organization appear to be similar to decentral organizations and are adequate for unstable environments. Indeed, Dierkes and Raske report from their study that hierarchical organizations saw their strength in their stability whereas decentral organizations saw their strength in their flexibility, both times corresponding to their respective environment.

Furthermore, Dierkes & Raske (1994a: 10) add that their research yielded the identification of a third type of organization: hierarchical organizations, which had either strong elements of the information and communication found in decentral organizations or which deliberately effected a process of change towards a decentral organization structure. This implicitly shows a clear trend of hierarchical structures evolving to decentral ones, i.e. the development of a stable to an unstable environment, which makes the flexibility of an organization increasingly important. This is what Dierkes and Raske fail to realise.

Additionally, it appears that Dierkes & Raske only stayed at the official formal level of “artefacts of the corporate culture” (cf. Schein 1992). Because in their analysis of company culture Dierkes & Raske only compare the values (as a part of the “company culture”), which were stated in the interviews (i.e. 50 interviews for 40 companies) with the wording in the corporate brochures (marketing brochures). These values of the

## 6. RESEARCH METHODOLOGY AND MODEL

company culture gained from the interviews were identical with the official statements. However, both are likely to be the official values, where the companies would like to be, but in fact unlikely are. As Schein (1992) points out, official formal values of company culture (as stated in interviews and brochures) cannot necessarily equated with the real informal values of a company.

### 6.1.5. Conclusion from the Empirical Studies

In summary, all four studies above deal with a different aspect of organizational learning. The first study by Shrivastava develops a set of six different types of organizational learning systems. The second empirical research by Ulrich *et al.* clusters a set of four different knowledge-acquisition strategies. The third work by Inkpen only deals with the learning in joint ventures. And the fourth study by Dierkes and Raske investigates the change learning process of companies and derives a set of two dominant organizational forms.

All this empirical work tends to cluster samples without any apparent theoretical underpinning of the methodology used. This applies even more to the measures of organizational learning outcomes. No indicators for organizational learning or learning outcomes are given in the first study by Shrivastava. It is neither clear from where the learning indicators are derived in Ulrich *et al.*'s paper. Inkpen's work only uses a very subjective indicator for organizational learning outcomes, which would not have been satisfactory for the standard of this thesis. And in Dierkes and Raske's study the success indicator for organizational learning is the age of the company, which is seen to be more than inappropriate, as has been explained above. *over*

Therefore, this thesis develops not only a set of more objective indicators for organizational learning outcomes, but it also investigates the sources and nature of organizational learning capabilities.

However, first the selection of the research philosophy and method is explained in the next section.



### 6.2. Discussion and Selection of Research Philosophy and Method

This section presents the foundation for the empirical research procedure by explaining the research philosophy and methods of research used. Any decision on the choice of research philosophy has naturally also an impact on the choice of the research methods used. Therefore, the choice of research philosophy is discussed first.

#### 6.2.1. Discussion and Selection of Research Philosophy

With respect to the research philosophy, there was a choice to be made between different schools of thoughts<sup>80</sup>, which was between “positivism” or “phenomenology”<sup>81</sup>, i.e. between a predetermined or a socially constructed world-view. Positivism vs. phenomenology can also be seen as naturalism vs. interpretation (Rosenberg 1988: 24) or natural science vs. an interpretative school of thought (Singleton *et al.* 1988: 36).

*Positivism*, on the one hand, aims to conduct social science like natural science, including developing laws and performing objective research of an objective world, focusing on facts. *Phenomenology*, on the other hand, accepts that social science has to deal with a socially constructed and subjective world, where the researcher is part of the observed and driven by human interests, focusing on meanings. The high attention positivism paid to numbers and computer modelling caused a counteraction of phenomenology in the 1970s, criticising positivist methods as not being objective, independent and value-free as claimed. Therefore, proponents of phenomenology advocated to bar empirical measurements and instead focus on meanings and understanding only (cf. also Easterby-Smith *et al.* 1991: 24ff).

This thesis takes the philosophical standpoint of the phenomenological paradigm, including the items like shown in Table 6.1. This applies

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<sup>80</sup> This sub-section also uses Gabler Wirtschafts-Lexikon (1988) as a source.

<sup>81</sup> For more information about positivism see Alexander (1985: 631ff) and about phenomenology see MacLeod (1968: 68-72) or Lassmann (1985: 587f). For a discussion of positivism vs. phenomenology see Rosenberg (1988: 1-27), Singleton *et al.* (1988: 35-38), Easterby-Smith *et al.* (1991: 20-43) or Blaikie (1993: 1-160).

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## 6. RESEARCH METHODOLOGY AND MODEL

especially to all the “basic beliefs”, such as that the world is socially constructed and subjective, that the observer is part of what is observed and that science is driven by human interests. The theory of organizational learning and the Learning Organization is seen as a help to understand a learning process in a holistic approach. Analytical tools included exploratory interviews, a questionnaire survey and in-depth interviews, which in turn were used to refine and extend the theory developed at the beginning of this thesis.

Table 6.1: Key Features of Positivist and Phenomenological Paradigms

	<i>Positivist paradigm</i>	<i>Phenomenological paradigm</i>
<i>Basic beliefs:</i>	<p>The world is external and objective</p> <p>Observer is independent</p> <p>Science is value-free</p>	<p>The world is socially constructed and subjective</p> <p>Observer is part of what is observed</p> <p>Science is driven by human interests</p>
<i>Researcher should:</i>	<p>focus on facts</p> <p>look for causality and fundamental laws</p> <p>reduce phenomena to simplest elements</p> <p>formulate hypotheses and then test them</p>	<p>focus on meanings</p> <p>try to understand what is happening</p> <p>look at the totality of each situation</p> <p>develop ideas through induction from data</p>
<i>Preferred methods include:</i>	<p>operationalising concepts so that they can be measured</p> <p>taking large samples</p>	<p>using multiple methods to establish different views of phenomena</p> <p>small samples investigated in depth or over time</p>

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Source: Easterby-Smith *et al.* 1991: 27.

The operationalization and questionnaire-based testing of two hypotheses, with the help of a larger sample, could be regarded as a positivist element of this research. However, using multiple methods, this was preceded and followed by discussions and interviews with a more phenomenological character such as developing ideas through induction as well as investigating smaller samples. This mixing is not an unusual

yes



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practice, as according to Easterby-Smith *et al.* (1991: 31) there are an increasing number of authors and researchers in social science who “argue that one should attempt to mix methods to some extent, because it provides more perspectives on the phenomena being investigated.” In case of contradictory results between the different methods employed, this thesis rather follows the phenomenological approach, i.e. focusing on meanings, than the positivist approach, i.e. focusing on facts. This is because the world is not seen as being external and objective, but rather as being socially constructed and subjective.

Although this thesis uses a more positivist paradigm when testing hypotheses (after having developed the hypothesis through induction from data according to the phenomenological paradigm), this was not done to establish fundamental laws about organizational learning, but rather to try to challenge the understanding of it. Thus, this more positivist part does not employ “logical positivism”, which is about confirming hypotheses. Instead, this thesis uses Popper’s “critical rationalism”<sup>82</sup> for empirical null-hypotheses testing, which is about trying to reject hypotheses in order to investigate the viability of the theory developed, i.e. the interaction between the Learning Organization’s characteristics, its outcomes and sources.

After classifying the thesis from a philosophical point of view, the *how* choice of the research method is addressed.

### 6.2.2. Discussion and Selection of the Research Method

When selecting the research method for this thesis, especially when preparing the questionnaire, it was necessary to determine which would be the most appropriate, either (1) a longitudinal (i.e. monitoring over time) or (2) a cross-sectional study (i.e. a snapshot view).

(1): The main advantage of *longitudinal studies* is the comparability of two or more investigations at different times. When some sort of change is introduced at a certain point in time, one can compare two or more stages

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<sup>82</sup> Cf. Popper (1959), but also Bartley (1985), Easterby-Smith *et al.* (1991: 39f), Flor (1992) and Blaikie (1993).



## 6. RESEARCH METHODOLOGY AND MODEL

of the change process (e.g., before and after a change) in order to gain insights into its effects.

This advantage can turn into a disadvantage, if there is no specific point of change available or if different research subjects perform their changes at different times.

The comparability of the different investigations is also questionable for various reasons: Firstly, there is a fluctuation in people, and the response rate is normally not high enough to guarantee that the same people answer the questions. This means that it is almost impossible to have the same sample of research within different runs of the investigation. Secondly, the same people tend to answer the same questions differently for the first time compared to the following times, because the primary effect is gone (there is obviously a difference if one answers a new question or answers a question already known to oneself). Thirdly, there is a possible bias described as the "honeymoon effect" by Oliver & Wilkinson (1992: 143 and 162f), which means that changes are sometimes greeted with enthusiasm that fades away after being confronted with the real problems of implementation. Fourthly, the questionnaires are rarely identical in different investigations as they are normally modified for reasons of improvement by the authors.

Additionally, a longitudinal study normally requires a lot of time (cf. also Easterby-Smith *et al.* 1991: 35) and monetary resources compared to cross-sectional studies.

(2): *Cross-sectional studies* not only have the advantage that they can be performed with limited resources of time and money, but cross-sectional studies can also ask for past figures, therefore, comparing the change of some variables in a more reliable way than in longitudinal studies, as discussed above. ?

The disadvantages of cross-sectional studies are that occasionally a lot of time has passed since some of the relevant occasions occurred, and there is a major problem remembering quantitative data, if it is no longer available to the respondent. On the other hand, sometimes past events are *seen* more clearly, i.e. without the "honeymoon effect".

This thesis is based on a cross-sectional approach for those variables at different times, which tried to measure the outcome of organizational learning. However, this was not possible for variables of the characteristics

of the Learning Organization, as the questionnaire was already relatively comprehensive. Furthermore, Easterby-Smith *et al.* (1991: 35) address the problem that cross-sectional designs cannot explain why correlations exist.

In summary, a cross-sectional study for this thesis was more appropriate than a longitudinal study out of following reasons:

Firstly, there is no single point, but a span of time, where one can assume that British suppliers started to acquire the characteristics of the Learning Organization. If changes happened they will vary considerably in their date and duration. Secondly, one would expect that many of the changes of suppliers towards the Learning Organization had already happened. Lastly, only limited resources were available for research.

However, in order to offset some of the disadvantages of the cross-sectional approach of the questionnaire-based research, it was combined with initial exploratory interviews and concluded with in-depth interviews. This combination of three different methods of investigation was developed to have a solid balance between empirical research procedures and to be able to confirm why correlations exist and whether they can be interpreted as causation.

### 6.3. Procedure for Empirical Research

This section deals with the procedure for empirical research in this thesis, which includes a description of the initial research procedure as well as the design of the research model.

#### 6.3.1. Initial Research Procedure

The empirical work started with a newspaper, magazine and report research about the automobile industry, focusing on Great Britain. Then a list of nearly 650 direct suppliers in Britain was compiled, including the names of the Managing Directors of each company. The sources were car producers<sup>83</sup> and trade associations in Great Britain (e.g., SMMT's Buyers' Guide 1993).

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<sup>83</sup> The names of the car assemblers are not disclosed for reasons of assured confidentiality.



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### 6.3.2. Exploratory Interviews with Car Component Suppliers

The next step was exploratory interviews (for a guideline see Part 2 of the Appendix), which were conducted with six direct car component suppliers in early spring 1995. The results of these exploratory interviews are presented in Chapter 7. The companies were selected randomly from the list of all firms included in this survey.

In conjunction with the literature review, the insights gained from these interviews were used to design a research model, which is introduced in the next sub-section.

### 6.3.3. Questionnaire-based Survey with its Research Model

The design of a research model for the questionnaire based survey is outlined here (the survey results are presented in Chapter 8). By this, the concepts of organizational learning and the Learning Organization are operationalized through survey questions. The questionnaire is presented in Part 1 of the Appendix at the end of this thesis. Its questions had to be satisfactory in terms of testing the hypotheses<sup>84</sup> developed below.

The key hypotheses investigate organizational learning in two ways:

The first hypothesis puts forward a positive impact of the Learning Organization's characteristic of car component suppliers in Britain on their organizational learning outcomes (intra-organizational learning)

The second hypothesis proposes that these characteristics of a Learning Organization of car component suppliers in Britain are predominantly acquired through some form of relationship with Japanese car producing or component supplying companies (inter-organizational learning).

#### 6.3.3.1. Elaboration of the First Hypothesis

The first research question explores the empirical relationship between the characteristics of the Learning Organization of companies and their capability to learn organizationally, i.e. to generate outcomes of organizational learning. The reason for this being that the literature to

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<sup>84</sup> Note: These hypotheses have to be converted to null hypotheses for empirical testing.



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date, as outlined in the first section of this chapter, has not yet approached analysis in this way. Although many authors refer to a link between the characteristics of the Learning Organization and the capability to learn organizationally, this has only be weakly underpinned by anecdotal evidence of some case studies (cf., e.g., Senge 1990, Leonard-Barton 1992 and Garvin 1993).

The first hypothesis is designed to test the impact of the characteristics of the Learning Organization found at car component suppliers in Britain on organizational learning outcomes. Therefore, the first hypothesis explores intra-organizational learning.

**Hypothesis 1:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization have better organizational learning outcomes.

In connection with this hypothesis further analysis is undertaken on whether or not characteristics of the Learning Organization are essential for a good performance in organizational learning.

The **characteristics of the Learning Organization** included in the hypothesis testing are as follows (see Chapter 3):

(1) Team work and team learning, (2) systemic thinking and mental models, (3) free vertical and horizontal flow of information, (4) education and training of the whole workforce, (5) learning reward systems for employees, (6) continuous improvement of work, (7) flexibility of company strategy and employees, (8) decentralized hierarchies and participative management, (9) learning laboratories and constant experimentation and (10) a supportive corporate learning culture.

This was combined with a research on **organizational learning systems**, which could either be team improvement systems or employee suggestion systems. A team improvement system is a formalized technique that enables the generation and implementation of ideas within teams which solve problems of an organization. An employee suggestion systems is a formalized technique that provides the opportunity for employees to voice their ideas on possible improvements in an organization (cf. also Ishikawa 1985, Dale 1994, Oakland 1995 and Russell & Taylor 1995: 106ff).

As has been explained in the first section of this chapter, current literature does not provide any information on how organizational learning

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outcomes are to be measured. According to our definition of organizational learning (presented at the end of Chapter 2.1.), organizational learning outcomes must be a function of at least individual learning which can be accompanied by team learning. Organizational learning outcomes manifest themselves in tangible improvements of efficiency and/or effectiveness of organizational performance. As a proxy, three groups of **organizational learning outcomes** variables were developed with the help of a theory-driven approach, and it turns out that the data allows to do so:

Firstly, the *amount of individual learning which turns into organizational learning*, measured by suggestions per employee implemented and team improvements implemented.

Secondly, the *speed of organizational learning*, gauged through the ratio of new products introduced compared to existing ones and the new product introduction compared to competitors.

Thirdly, the *amount of quality improvements*, measured by improvement of internal quality per units produced (i.e. quality during the production process) and improvement of external quality per units produced (i.e. quality the customer receives).

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### 6.3.3.2. Elaboration of the Second Hypothesis

The second hypothesis tests the impact of personal contact between car component suppliers in Britain and Japanese companies in the automobile industry on acquiring the characteristics of the Learning Organization.

Japanese companies are frequently quoted to be Learning Organizations (e.g., Toyota (Adler & Cole 1993), Honda (Garvin 1993 and Senge 1990) and Canon (Nonaka 1992)), though this might be not the case for all of them.

There are also some examples of Learning Organizations in the US (e.g., Home Depot (McGill & Slocum 1993), Chaparral Steel (Leonard-Barton 1992), Analog Devices and Hanover Insurance (Senge 1990)). In Europe, however, literature seems to be unsure about whether or not an ideal of the Learning Organization exists. And, except Royal Dutch/Shell

(implications?)



(de Geus 1988), there are discussions about companies like Volvo<sup>85</sup> (cf. Berggren 1994) as to whether they can be defined as such, or if they only are special forms of evolving organizational structures (e.g., Rover Learning Business (Thurbin 1994 and Pedler *et al.* 1991)).

It is suggested that for the acquisition of characteristics of the Learning Organization an extensive knowledge transfer of explicit and especially tacit knowledge from Learning Organizations is needed. Krafcik (1986: 25-30, cf. also Womack *et al.* 1990: 163) mentions an example where an American supplier learns from Japanese companies in the car industry, and suggests that “considerable learning is occurring among American suppliers” (Krafcik 1986: 28). Andersen Consulting (1994: 5) state that the “UK has benefited from foreign investment and the plants supplying Japanese customers appear to be learning from these customers.” Both do not go into further detail, therefore, this is addressed in the second hypothesis.

The literature quoted above assumes that Japanese car companies come close to the ideal of the Learning Organization. For transfer of tacit knowledge about the Learning Organization intensive personal contact is required. This leads to the second hypothesis, which investigates inter-organizational learning. sh?

**Hypothesis 2:** Those car component suppliers in Britain who have a relationship with Japanese companies have higher scores in the characteristics of the Learning Organization.

Hypothesis 2 tests whether it is appropriate to say that knowledge transfer of the characteristics of the Learning Organization is related to intensive contact with Japanese companies in the car industry as the important source of tacit knowledge.

The importance of personal contact in the form of “socialization” to transmit tacit knowledge is also mentioned by Nonaka (1994: 19) (see Chapter 2.2.). This thesis concludes that only a limited amount of tacit knowledge is transformed into explicit knowledge (externalization),

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<sup>85</sup> In contrast to Berggren, Adler & Cole 1993 and 1994 doubt that the Volvo plant Uddevalla (which was shut down in May 1993) really was a Learning Organization. This discussion has been more closely analysed in Chapter 4 of this thesis.



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because of its implicit nature, but also because it would be very demanding and resource-consuming to do so. Therefore, the most common way to pass on tacit knowledge is by personal contact (socialization).

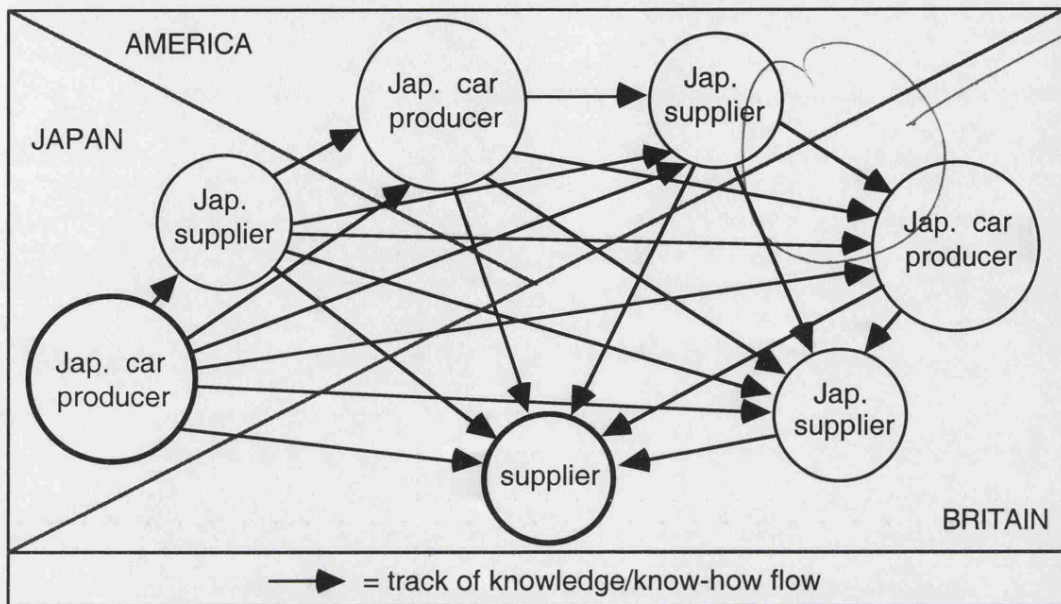
The characteristics of the Learning Organization mainly originate in Japanese car assemblers in Japan, America or Britain, but also Japanese car component suppliers in Japan or America (see Figure 6.3).

The most important reasons for the generation and acquisition of these characteristics by Japanese car assemblers were (see Chapter 4):

- The Training Within Industries Programme from America, which helped to build the characteristics of continuous improvement and of training and education.
- The Japanese Union of Scientists and Engineers (JUSE) guiding the diffusion of quality-control (QC) circles, which was institutionalized as a unit of JUSE, called QC Circle Centre, in order to promote circle activities.
- And severe strikes at Toyota and Nissan in the beginning of the 1950s, which developed a different approach towards employees in terms of more information exchange and a corporate culture supportive of learning, therefore, contributing to the development of systemic thinking.

not good enough?  
prob. of not having  
good org. theory  
background

Figure 6.3: Sources for Characteristics of the Learning Organization



There are various flows of knowledge about the characteristics of the Learning Organization. This knowledge influences the intensity of deuterolearning (learning learning) and double-loop learning (change learning) with which car component suppliers in Britain acquire the characteristics of the Learning Organization.

There are five potential categories (combinations are also possible) of **direct sources of knowledge** (i.e. Japanese car companies or component suppliers) for component suppliers in Britain:

- (A) Owner
- (B) Customer
- (C) Partner
- (D) Supplier
- (C) Co-member

Whereas Japanese car producers can only be (A) owners or (B) customers, Japanese component suppliers can be (A) owners, (B) customers, (C) partners, (D) suppliers to component suppliers in Britain or (E) co-members in the same supplier organization, which can include competitors. This thesis proposes to use this entire list as direct sources for



Better theoretical  
background for all this  
could have been  
transferred techniques literature!

Yes, say not look at over  
Is trying to teach suppliers  
vice versa

#### 6. RESEARCH METHODOLOGY AND MODEL

the characteristics of the Learning Organization of the suppliers in Britain.  
The following explains, how the relationships may look in detail.

(A): A Japanese **owner** of a supplier in Britain as a source can be in the form of a Japanese car producer or a Japanese component supplier, which can range from sole ownership to co-ownership.

The transfer of knowledge through personal contact can be made in two ways. This can either be through the owner's experts being sent to the supplier, who teach, advise or work in a team together, in order to improve existing processes or products, or solve problems. Alternatively, it can be through the suppliers' employees being trained by or working at the owner's site. It is assumed that the flow, especially of tacit knowledge, goes more or less in one direction only, i.e. from the owner to its subsidiary supplier.

(B): A Japanese **customer** of a supplier in Britain, as another source, can be either a Japanese car assembler or a Japanese component supplier. The types of learning can take various forms again. One way is that the Japanese customer sends experts to the supplier in Britain, these experts then teach, advise or work in a team together with the supplier's employees, in order to improve existing processes, products or solve problems. Another way can be through the supplier's employees being trained by, or working at the site of, the Japanese customer and bringing back the essential knowledge for the generation of the characteristics of the Learning Organization.

(C): A Japanese **partner** as a further source can be in the form of various co-operative relationships. This can be licensing of a patent, owning a joint venture together or some other different form of strategic alliance with a Japanese supplier. Depending on the type of such co-operation this can involve significant exchange of explicit knowledge, but particularly tacit knowledge, through personal contact.

(D): A Japanese **supplier** for components or materials is regarded as another possible major source of the Learning Organization's characteristics for a supplier in Britain. This relationship can include various forms of tacit knowledge transfer like joint project teams for improvements or for the development of new products. This can imply exchange of employees, even for long periods.



## 6. RESEARCH METHODOLOGY AND MODEL

(E): A Japanese **co-member** in the same supplier association, last but not least, can also be a source. The relationships in supplier associations can rank from very loose meetings to focused teachings, from including only top management to including employees from different levels of hierarchy, in order to transfer knowledge.

These five sources are regarded as an “essential” but not necessarily “sufficient” cause for the variation<sup>86</sup> in strength among the different Learning Organization’s characteristics found at car components suppliers.

In order to explain these variations, the following causes for deviation are listed:

- (1) Resources for implementing change
- (2) Receptivity of management and employees
- (3) Duration of a relationship
- (4) Intensity of this relationship

These factors are looked at closer below.

(1): **Resources for implementing change** influences both the duration and the intensity of change towards the ideal of the Learning Organization. The resources have to be sufficient to enable a change; but if there are too many resources, change is perceived to be unnecessary. Alternatively, if the resources are not sufficient, change is not possible due to a lack in capacity.

(2): **Receptivity of management and employees** deals with the openness of management, on the one hand, and of the employees, on the other. It is not enough for management alone to be convinced that the organization should become a Learning Organization, but the employees have to be convinced, too, because they play an important role in organizational double-loop learning. Both, management and employees, live in a corporate culture and this can sometimes be a filter for receptivity.

(3): **Duration of a relationship** simply deals with the assumption that the longer a relationship lasts the more opportunity there is to transfer

why is  
learn from  
elsewhere?  
was RCB learned  
from H?  
Hardly!

---

<sup>86</sup> A further explanation for the variation could be a heterogeneous impact of different Japanese companies.

## 6. RESEARCH METHODOLOGY AND MODEL

explicit and tacit knowledge about the Learning Organization. Thus, the longer a relationship with a Japanese company in the car industry lasts, the more distinct are the characteristics of the Learning Organization with a supplier in Britain.

(4): **Intensity of a relationship** is another variable that applies only to suppliers that have Japanese companies as owners, customers, partners, suppliers or a combination thereof. Intensity refers to the form of horizontal and vertical personal contact (e.g., visits, meetings, project work, long-term exchange of personnel or training) as well as its frequency. The more intensive a relationship is the more explicit and especially tacit knowledge is transferred. Therefore, it is suggested that a supplier in Britain has more distinct attributes of the Learning Organization the more intense the relationship is with a Japanese supplier in Japan or a Japanese car producer.

In summary, Hypothesis 2 claims that characteristics of the Learning Organization are mainly derived from intensive personal contact with Japanese car assemblers or Japanese car component suppliers. In order to differentiate which Japanese car assemblers and car component suppliers were responsible for the transfer of characteristics of the Learning Organization, the name of the company was asked for in the questionnaire.

*requires a test of other sources too*

After the elaboration of the two main hypotheses, the next part deals with the operationalization of the questionnaire items and its design.

### 6.3.3.3. Operationalization of Items and Questionnaire Design

This thesis operationalizes items (i.e. normally an answer to one question) and develops a questionnaire in conjunction with the semi-structured exploratory interviews mentioned above, which were piloted and sent out to direct car component suppliers in Britain.

The preferred target group for the questionnaire is Managing Directors, because they have the best overall view of the company, but also other members of the top management. Senge (1990: 299f and 1990a: 10f), for example, emphasizes the pivotal role of top management for being the “constructor” of the Learning Organization. Additionally, because of their status of power, it is easier for top managers to get all information



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required for answering the questionnaire, i.e. get other employees to answer specific questions.

However, these top managers, like anybody else in a company, also have a subjective view. This can make them see the reality of their company sometimes more as they would like it to be, instead of as it is. Thus, later in this thesis, the spectrum of people questioned will be broadened to the shopfloor workers with the help of in-depth interviews, in order to gain a more objective insight into the companies' reality, as different subjective views are balanced. *poor methodology that is so much for phenomenology*

The questionnaire attached in Part 1 of the Appendix shows the structure of the questions. There are ten question units for each element of the Learning Organization, and a further unit each for organizational learning, organizational change, company data, including selected factors for successful organizational learning as well as relating to customers and suppliers. These questions were derived from statements in the literature about organizational learning, experience from former research and exploratory interviews with car component suppliers in Britain, as well as analytical research and the development of the theory of organizational learning and the Learning Organization.

### 6.3.4. In-depth Interviews with Selected Suppliers

Four car component suppliers who completed the questionnaire were selected for in-depth interviews (for a guideline see Part 3 of the Appendix), in order to get some deeper insight into the characteristics of the Learning Organization, their outcomes and their origins. These four component suppliers consist of two different groups made up of two companies each.

Two companies had high overall scores as far as the characteristics of the Learning Organization are concerned as well as organizational learning systems. They were examined because they were exemplary companies, therefore, it was interesting to describe the process of how they became Learning Organizations. The other two companies had low scores, the reasons for this were worth investigating as well.



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### 6.3.5. Summary of the Research Methodology and Model

In summary, this chapter introduced the research methodology and model in this thesis, which is a combination of three steps:

Firstly, exploratory interviews were conducted, in order to test the general approach of this thesis and elaborate the hypotheses.

Secondly, a questionnaire was mailed, in order to empirically test the two hypotheses developed with a larger sample.

And thirdly, in-depth interviews with selected companies were held, in order to obtain a coherent picture to support the findings and to confirm the interpretations of the questionnaire survey.

The next chapter provides an analysis of the exploratory interviews with representatives of the management of six different components suppliers.

*Why refer to  
exploratory  
interviews  
at all?*

## 7. Analysis of the Exploratory Interviews

As the first of three different steps of the empirical research procedure of this thesis, this seventh chapter deals with exploratory interviews. They show some first evidence supporting the Hypotheses 1 and 2. Both hypotheses are tested in a more formal approach with the help of a questionnaire survey in Chapter 8 and are corroborated in the concluding in-depth interviews in Chapter 9.

Six car component suppliers<sup>87</sup> were chosen for the initial research about the characteristics of the Learning Organization, their outcomes and sources. Exploratory interviews (for a guideline see Part 2 of the Appendix) were conducted with representatives of the management of these companies. All had in common that they were producing car components in Great Britain and usually the plant visited was the one including the headquarters of the company.

This research developed measures to benchmark the characteristics of the Learning Organization and outcome of organizational learning. These measures could then be used in the subsequent empirical, questionnaire based analysis with a larger sample. Using this larger sample, the characteristics of the Learning Organization could be investigated more reliably and in greater depth than it would have been possible in the exploratory work.

The exploratory interviews lasted between 45 to 60 minutes and were conducted in early spring 1995.

Company A, the first car component supplier visited, was a joint-venture between a Japanese and a non-Japanese company. Both, the Commercial Director and the Personnel Manager were interviewed. Additionally, a factory visit was made, in order to get an insight into the working methods and the changes the company went through since it became a joint venture.

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<sup>87</sup> Because of assured confidentiality, no names of components supplying companies and persons are mentioned in this thesis. The six suppliers are referred to as Company A, B, C, D, E and F according to the order of interview dates. For the same reasons the products and size are not divulged, as it would be relatively easy to identify the companies and their plants for industry insiders.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

*will this be covered at?*

*Note wide variety of interviewees despite claim wanted mds*

At Company B a meeting was arranged with the Team Learning Project Manager. It also included a factory tour. Company B took part in the “Learning from Japan Initiative”, sponsored by the DTI (the department for Enterprise)<sup>88</sup>, which introduced selected British car component suppliers to Japanese counterparts, enabling the former to learn from the latter.

At Company C the Managing Director was interviewed. The Human Resources Manager conducted the factory tour, which also included the learning and training facilities.

Company D was the fourth one, with interviews of two managers of the Human Resources Department, which again included a factory tour.

At Company E the fifth exploratory interview was conducted with the District Manager, who guided a factory tour as well.

Company F was the sixth and last car component supplier visited, and this time the Engineering Manager was interviewed.

This chapter investigates the characteristics of the Learning Organization and the outcomes of organizational learning, followed by an analysis of the origins of these characteristics.

### 7.1. The Characteristics of the Learning Organization<sup>89</sup>

All ten characteristics of the Learning Organization dealt with in this chapter were developed in Chapter 3.3. from the current literature. Whether and how these characteristics exist in reality, and in which combination, were some of the questions posed during the exploratory interviews of the six car component suppliers. The results of these exploratory interviews are outlined next.

#### 7.1.1. Systemic Thinking and Mental Models

As explained in Chapter 3, the characteristic “systemic thinking and mental models” is theoretically the most important characteristic of the

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<sup>88</sup> For more detailed information see DTI - Vehicle Division (1994).

<sup>89</sup> Cf. also Rosengarten 1995.



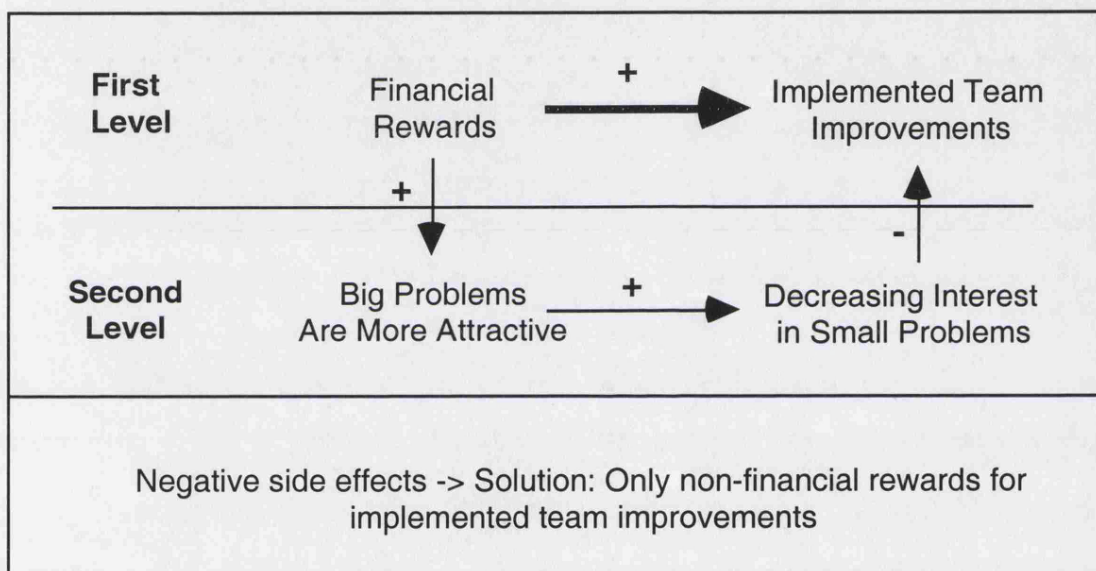
## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

Learning Organization. In reality, it is not easy to identify, especially if this is done only through interviews with management representatives. Nevertheless, some interesting insights for later research have been gained.

In order to illustrate the way “systemic thinking and mental models” work, this sub-section focuses on two examples.

The first example is about why most suppliers, except Company A, did not give financial rewards to their employees for implemented team improvements, as this had negative side effects (see Figure 7.1).

Figure 7.1: Side Effects of Financial Rewards for Team Improvements



Although, at first sight financial rewards have a positive effect on the generation and implementation of team improvements, there is especially one side effect that can have a very negative influence on the effectiveness of continuous improvement teams in the long run. This side effect on the second level is caused by the fact that only big problems are attractive to employees or management, because of the high payoff and, thus, small problems are neglected. This leads on the whole to a loss of a potential increase in quality and productivity, because of the negative impact on generation and implementation of team improvements.

There is an attempt to avoid this side effect by the majority of suppliers interviewed by relying heavily on non-financial rewards like token, gifts,

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medals, certificates, presentations of achievements or public appraisal through different communication channels.

Where financial rewards for continuous improvements were given, it was mainly done indirectly. This means instead of directly paying a lump sum, the involvement of an employee in continuous improvement activities was taken into account when there was a decision to be made about salary increase or promotion (normally linked to a salary increase as well).

The manager of Company C, describing the problem and its solution, said aptly:

“We decided not to give a monetary reward, because it is divisive, it creates jealousy, it makes people always focused on big things, and all these little things get left; and for all these people getting less money - you stop those. The idea is to get everybody - some people may make a big gain some people may make a little gain, but you want all of them. No money, no monetary reward.”

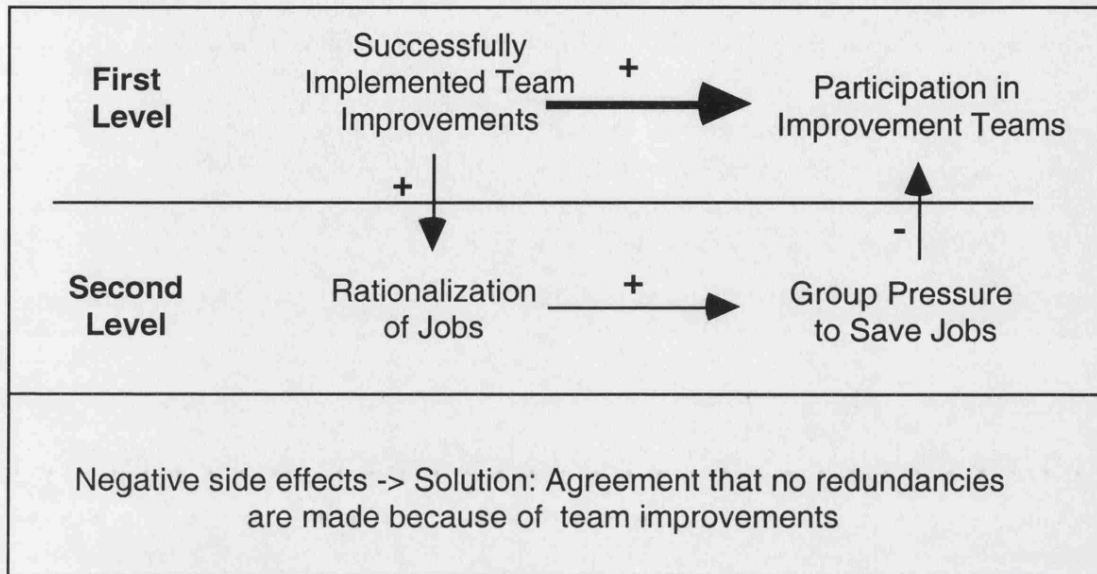
A similar logic of systemic thinking applies to the second example of how to implement team improvements successfully (see Figure 7.2). They normally lead to more participation in activities of improvement teams because success normally amplifies the behaviour pattern of participation.

How was  
the test  
of  
systematic  
thinking?  
A mental  
model? Was it  
adequate?



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**Figure 7.2: Side Effects of Successfully Implemented Team Improvements**



However, on the second level a negative effect of these implemented improvements can be the rationalization of jobs, which again leads to group pressure to save jobs. As a consequence, this has a negative side effect on the participation in improvement teams in the end.

In order to avoid this negative side effect, an agreement between employees and the management can be negotiated, which commits the company not to make anyone in the company redundant because of successfully implemented team improvements. Instead potentially redundant staff are employed somewhere else.

This was done for example in Company A, which tried to keep to this policy even in the recession of the early nineties. The manager comments as follows:

"I think that brought us a lot of respect and commitment from people [working for Company A]."

Continuous improvement of work is discussed now as the second most important characteristic of the Learning Organization.

*that was a  
his  
systemic  
thinking*

*suppressed  
the most  
important  
characteristic!*



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or had engineers?

### 7.1.2. Continuous Improvement of Work

For “continuous improvement of work” there are theoretically two methods. Firstly, an employee suggestion system and, secondly, a continuous improvement team system. The two could also be combined.

However, the majority of the companies interviewed had either abandoned their employee suggestion scheme or it only played a minor role. The main reason for this was bad experience in the past: the time needed to implement the improvements generated was normally too long (if they were accepted by the management at all). This caused a lower participation rate of the employees, and normally led to a decline in employee suggestions.

A manager of Company D remembered:

“In the engineering department it took often months to evaluate it [the suggestion], in which time the people had sometimes forgotten that they made them - a nightmare, and according to my experience that is not uncommon.”

This seemed to be caused mainly by a bureaucratic system, which was not focused on the quick processing of employee suggestions.

The manager of Company F described the situation as follows:

“We used to have one [an employee suggestion system] a long time ago . . . . A traditional scheme “win a Mini or some money”, but that was disbanded a long time ago and we just have the [continuous improvement team] scheme I described.”

Five of the six companies had introduced a continuous improvement team system. Company B did not have it, but intended to introduce one in 1995/6. Continuous improvement teams were generally self-organizing teams. This means that when an employee has an improvement idea, he/she selects the people for his/her continuous improvement team (who may be engineers as well). The team leader is sometimes chosen by the team sometimes by the management (not necessarily by the person with the idea) and a plan for problem solving and implementation is designed.

The fact that this procedure is sometimes an outcome of experience, derived from trial and error, is shown by the following quotation from the manager of Company C:

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“We started to select team leaders for the improvement teams, but the more you force it the more it does not work. It is better if you can find a natural leader and a natural level.”

And another manager from Company E explained:

“The teams themselves would generally appoint their own chairman, who would be the best person, or they may be shared depending on how it is organized.”

In order to keep the wheel of continuous improvements going, besides the reward systems for employees, there were frequently people, who acted as co-ordinators, installed at middle management level. They monitored the continuous improvement teams, helped them when appropriate, and they were sometimes also responsible for spreading the new knowledge gained to other departments or units in the company. Describing the co-ordinator, the manager from Company C commented:

“He [the co-ordinator] encourages the teams and if it gets to a stage where they’re having difficulties he all sorts it out. He also ensures that things, as such as the room, is available. . . . He makes sure that the meetings are actually run and that minutes [are taken], he keeps record of all things that moved along so that we can look back at the end and see if they have actually been progressing”.

Other factors that were seen to be helpful by management for the ongoing process of continuous improvement were peer pressure on the “push” side and the feeling of success on the “pull” side.

It was emphasized by the manager of Company E that the first team members must be carefully selected by management, as motivation and experience is important to ensure success when introducing continuous improvement teams.

The manager from Company C was convinced that suggestions for improvements have to come from inside the team:

C.O.S. → Is what a  
quite weird  
thesis

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

This is all  
descriptive  
to + sh  
"S technique  
rather than  
C.O.S.  
pose

"I think if you make this process led by supervisors, and if you make it punitive, make it dictatorial, it will fail. Also, if you make it look at a specific problem and the suggestion for looking at that problem comes from outside the group."

### 7.1.3. Team Work and Team Learning

The majority of the companies introduced team work in the early 1990s. This means that before that there was a more Tayloristic structure, which included supervisors and foremen (their change of roles are discussed later in this chapter), and no explicit team work nor team learning took place in the companies interviewed before the nineties.

"Team work and team learning" applied to intra-organizational teams as well as inter-organizational teams at all the companies interviewed.

*Intra-organizational teams* were predominantly continuous improvement teams (e.g., improvement of machines), but also product development teams, which would consist of people from different departments and levels of hierarchy.

*Inter-organizational teams* were established for co-operation with customers, suppliers and partner companies. Teams with customers led to a higher responsiveness to their needs. All teams consist of a mixture of employees from different companies. Again, people from different departments and levels of hierarchy ensure an efficient exchange of information by this kind of teamwork and learning.

For example, the planning of change and improvement of the distribution system of Company C was done with 6 - 8 own employees together with employees of its customer, Rover, and a forwarding agency, all in one team.

The team can also take the form that one employee of a different company is included in an intra-organizational team. For example, an engineer of Company B joined another company for the purpose of product development. The manager of Company B described the relationship with one customer like this:



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“That’s a sort of: they come here and do it, and we go there and do it, and it is very much a crossing of information both ways.”

Regarding team size, a distinction has to be made between the teams for shopfloor work (on-line teams) and the teams for team learning (off-line teams), which do not exclude each other. For example, in Company A the team size for shopfloor work was between 8 and 15 staff.

In Company C the team size for team work and team learning was kept to around 12 people, because it was perceived that staff were able to relate to each other and work with each other only up to this size. The manager of Company C explained:

“More than 12 is too many. . . . 12 is a manageable number, because it means that you can talk to everybody about problems if you need to. . . . And I would say, we are three years into this now, the smaller the teams the more effective they are.”

Effectiveness was measured in Company C by the rate at which teams solve problems and the speed with which problems are solved.

In Company D the team size for shopfloor work in production was only 3 to 4 staff, depending on the size of operation. Teams for learning (suggestion teams) were up to 8 people, which was seen as the maximum manageable size in Company D.

It appeared that the size of the team depended more on the kind of operation, as well as the philosophy of the company, rather than its absolute size.

### 7.1.4. Free Vertical and Horizontal Flow of Information

“Free vertical and horizontal flow of information” was assured by various measures such as the intra- and inter-organizational teams mentioned above. Other forms for securing information flow were daily briefings, meetings (in periods of weeks, months or years, depending on the size of the meeting and the company), newsletters or even videos.

The manager of Company C stated:

“Once a quarter, I talk to all of the workforce in groups - not more than 30. I won’t talk to more, because you lose the attention. . . . So, yes, we encourage that the communication is

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going in two ways. Then there is a quality newspaper that is produced once a month by the employees, not by the management.”

Regarding the source of better communication Company B’s manager recalled organizational double-loop learning from Japanese companies:

“We are a lot better informed now than we had been before, and I think a lot of that is due to the Japanese Initiative [DTI initiative on Learning from Japan]. Communication is a big thing, is a definite thing, that has come out the Japanese Initiative, and we realized that we didn’t communicate at all, what we should have been doing. And we now have a completely different communication structure to prior the Japanese Initiative. We are sure it does not work for a hundred per cent, but it works a hell of a lot better than when we first set out.”

How far communication with customers can go was explained by the manager interviewed for Company A, who focused on ways of tacit learning of the whole organization through personal contacts:

“Chemistry has to be good between supplier and customer. The Japanese, and we do it now ourselves, see the organization as a three dimensional cube, which layers have to be interconnected. Chief must know chief, technician must know technician - the key connections must be identified, even going into private sphere.”

Spreading of knowledge about newly implemented continuous improvements was done by project presentation by the continuous improvements teams (e.g., Companies C and F), newsletters which were published monthly or bi-monthly (e.g., Companies A, C and D), or it was done by the staff who were responsible for the supervision of the continuous improvement process (e.g., Company D).

### 7.1.5. Education and Training of the Whole Workforce

All companies interviewed preferred to train their workforce in-house. Depending on the company’s size, this training was effected either by employees, or whole HRM or Personnel departments, i.e. specialists who were responsible for education and training. The majority of companies

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interviewed preferred to develop their own range of courses for educating and training employees in a modular structure. Platforms for the course design were either the modification of courses from somewhere else for their own specific needs, or the use of “Training Within Industries” modules (see Chapter 4.2.) as a design platform.

The in-house training was also combined with standardized training courses on cassettes, interactive videos or laser discs. Staff at higher levels of the hierarchy were additionally sent to attend courses accredited by the National Vocational Qualification Council. Further sources for education and training from outside were trainers from the customers, consultants or seminars.

The training requirements were generally not prescriptive, as a statement of the manager of Company C best described:

“We try not to dictate in training. What we insist on is that every employee has a minimum level of training in quality, a minimum training about the products we make and a minimum training about the job they do and the job that is done before that and the job that is done after that - that’s it for everybody.”

Another manager from Company D explained:

“We are looking at competence-based training based on skill elements in the jobs, which includes quality and safety specific to that job. And we’re looking at - separately and simultaneously - at core modules which are knowledge-based modules about safety, quality, continuous improvement and training with the idea that each employee should really be able to train others in job and other related matters.”

Most of the companies also employed people or whole teams, in order to train their own supplier companies in working or problem-solving techniques (e.g., Companies A, D, E and F). In a sense this can be seen as education and training of the extended workforce. Company E’s manager indicated that during this teaching process his company is open to learn from their suppliers as well.



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### 7.1.6. Learning Reward System for Employees

Among the suppliers interviewed there seemed to be a trend of not giving direct rewards to their employees for acquiring new skills. For them it went without saying that employees who have learned more, were more capable of achieving a better performance, which in term leads to an increase in salary and/or to a promotion.

For participation in continuous improvement the situation was similar insofar as management preferred to give non-financial rewards as has been indicated above. However, not every company had reached its goal of recognising team improvements at the time of the interview. In fact, one manager from Company D regretted that the recognition and reward did not yet favour team improvements enough:

“We are not giving emphasis to people who actively take part in continuous improvement or take part in team work. And I think we have to change that.”

### 7.1.7. Flexibility of Company Strategy and Employees

The example of Company B that revised its mission once a year, and adjusted it if appropriate, shows how extreme the flexibility of a car component supplier's strategy can be.

The other companies showed their flexibility through the considerable changes they had gone through in the previous years, especially concerning the change towards team-based structures on the shopfloor as well as in the offices.

Regarding the flexibility of the employees, the majority of the companies indicated that with the introduction of team work employees should be able to perform at least three different jobs. This served the purpose of employees being flexible to do the job of other team members who were not available for various reasons. However, it also gave the companies the opportunity to rotate jobs to make work less monotonous, which made the jobs more interesting and avoided injuries caused by repetitive work.

*superficial*

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

### 7.1.8. Decentralized Hierarchies and Participative Management

The move towards having a decentralized hierarchy and participative management was normally introduced in the companies when team structures were introduced. Whereas the latter was clearly in place, the process of decentralizing hierarchies and participating employees in management appeared to be far from complete.

The introduction of a team structure changed the role of the supervisors on the shopfloor. Instead of being in the office separated from the production process, the team leader spent about 80% of his time in productive work (on line) and 20% with supportive work (administration). This had been the other way round in the past, according to Companies A and B. This is only one example to show how the work content for supervisors has changed.

All suppliers interviewed reported problems in making the old supervisors change their role to take on more responsibilities and the need for social competence. The most favoured option was to train them with the newly required skills. However, some did not want to change or could not change.

A comment from Company B was:

“Some of the old supervisors have resigned from the process [of applying for team leader] when they found out what we were looking for because they thought it was too different from that what they were actually doing.”

Therefore, they had to find another job in the company or had to leave.

### 7.1.9. Learning Laboratories and Constant Experimentation

Learning laboratories were hard to identify through interviews. However, during the factory tours it became obvious that some suppliers (e.g., Companies A, B, D and E) had some machines on the factory floor with which they could experiment. This was done besides or as a part of the normal production process, until the companies were sure that these new machines were reliable enough to be introduced in a larger quantity; either to be added to the existing machines or to replace old ones.

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Regarding experimentation the manager from Company C stated:

“We don’t do experimenting in a formalized role. I think that the concept is part of the task of whoever the chief executive in a company is to try to encourage his people to come up with ideas and then let them experiment. I think rather than formalizing that by having a department for ideas and for experimentation the view is then it is somebody else’s [task]. . . . It’s the same with experimentation and creativity and wanting to try a new thing, [it] is, I think, the part of what all of them do and within reasonable levels ought to be encouraged.”

However, he also admitted that this was a lot easier to do in a small or medium-sized enterprise compared to a large one. The underlying reason was that communication tends to be easier and, therefore, better the smaller a company is.

### 7.1.10. Supportive Corporate Learning Culture

Most of the car component suppliers were still in the process of changing their culture towards being more supportive to organizational learning. A manager of Company D, who was pushing this process of change, complained:

“Unfortunately, changing culture is not just a matter of changing views of the people on the shopfloor itself, it’s also changing managerial perceptions as well.”

The manager interviewed from Company E gave the following impression of his company’s culture:

“Regardless of what you are doing the culture is always changing, and really what we try to do is to show to the people that the culture is just a mirror image of themselves. So, if they are not happy with how the culture of the company is, then it’s their own fault in a way and that everybody has it within themselves to influence the culture of the company. So we don’t have a position of saying ‘this is where we want to be’, we have a position saying we are a company that is continually improving, have an open management style and an open approach so that



## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

people are here encouraged to say what they think and not say 'yes, yes, yes' and then walk out the room and say 'that's a lot of rubbish'."

However, he admitted that this cultural change takes time:

"It's more a way of saying what you do and how you behave in the company is the culture of the company."

Openness was also stressed by another manager of Company C as being important regarding communication to the employees.

Additionally, communicating the truth is seen to be important to create trust among all members of the company. A comment about trust by the interviewed manager of Company E was:

"Oh, I think trust is an important issue. And to be quite honest in some cases we have to build that trust. You don't break down this barrier just by saying 'right, you're now on staff status and we think you're equal to us' and so on. So it isn't finished - it's still continuing to be important. But what we're trying to do is to create the environment for the people to be involved and to express themselves, and we still have some way to go, but we are moving in the right direction."

These changes include the introduction of the same staff status and its terms and conditions for the shopfloor employees as for the people in the offices, as well as the introduction of learning incentives for employees.

### 7.1.11. Summary and Conclusion

These six exploratory interviews could answer a limited number of questions raised in the theoretical part of this thesis. As originally intended, they helped to gain an insight into how the characteristics of the Learning Organization are manifested in reality. These characteristics of the Learning Organization appeared to be multi-dimensional in the exploratory interviews and are, therefore, measured along a scale rather than a dichotomous variable (e.g., "yes" or "no") in the questionnaire.

The various characteristics of the Learning Organization, which have been detected in some form or another are compiled below in Table 7.1. It is only an overview of the observations made from the interviews and

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factory tours, which were not strictly standardized. Therefore, one should be aware of the limitations of this overview and that the research method of the exploratory interviews was not intended to achieve an accurate comparison. This will be the objective of analysing the questionnaires in Chapter 8.

Table 7.1: Observed Characteristics of the Learning Organization

Comp.	1	2	3	4	5	6	7	8	9	10	.1	.2	.3	.4	.5	.6
<b>A</b>	X	X	X	X	X		X	X		X	x	x		x		
<b>B</b>	X		X	X	X	X	X	X	X	X	x		x		x	
<b>C</b>	X	X	X	X	X	X	X	X	X	X	x		x	x		
<b>D</b>	X	X	X		X	X	X	X	X	X					x	x
<b>E</b>	X	X	X	X	X	X	X	X	X	X				x	x	x
<b>F</b>	X	X	X	X	X	X	X	X		X	x	x	x		x	x

X = Characteristics of the Learning Organization, which appeared to be observable in some form during the exploratory interviews or factory tours

Explanation of the numbers:

1 = Systemic thinking and mental models

2 = Continuous improvement of work

3 = Team work and team learning

4 = Free vertical and horizontal flow of information

5 = Education and training of the whole workforce

6 = Learning reward system for employees

7 = Flexibility of company strategy and employees

8 = Decentralized hierarchies and participative management

9 = Learning laboratories and constant experimentation

10 = Supportive corporate learning culture:

10.1 = Dialogue, 10.2 = Shared interpretation of reality, 10.3 = Shared vision of the future,

10.4 = Openness & trust, 10.5 = Commitment & tolerance, 10.6 = Risk taking & responsibility

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In summary, the major findings of the exploratory interviews and factory tours with the six car component suppliers were as follows:

Firstly, the characteristics of the Learning Organization appear to be observable at car component suppliers in Great Britain to a varying extent.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS


Therefore, it seems to make sense to explore these in greater detail in the questionnaire analysis.

Secondly, the majority of the companies have either abandoned the employee suggestion scheme or it only played a minor role, because it did not work as successfully as intended. Amongst the reasons indicated for this the most dominant appeared to be inappropriate management or structure. However, it is suggested that the failure of this scheme is multi causal. The most important reason appeared to be an inadequate bureaucratic system that was not capable of working quickly and efficiently. The nature of the inappropriateness and inadequacy will be explored further in the in-depth interviews in Chapter 9.

Thirdly, continuous improvement teams were dominant and seemed to work successfully. They were mainly self-organizing and largely acted independently from management. This means that these teams chose their own team members, team leaders and problems as well as developed implementation plans for the solutions predominantly themselves. In some cases co-ordinators of continuous improvement teams were appointed at the middle management level. They kept the continuous improvement process going, and sometimes also tried to disseminate the new knowledge generated inside or acquired from outside.

Fourthly, the majority of companies did not pay direct financial rewards to employees, neither for continuous improvement activities and outcomes nor for acquired skills. The reason for this was that these suppliers assumed that consideration would be better given indirectly through pay rises and/or promotions, in order to avoid negative side effects, like only focusing on big problems.

These exploratory interviews showed that car component suppliers constitute interesting subjects for research, because they show some distinct characteristics of the Learning Organization. However, it is not possible to make accurate statements about which of the companies investigated can be regarded as being more a Learning Organization and which less. This will be possible when appropriate selection criteria have been developed. Therefore, future work concentrates on the development of measures for the Learning Organization's characteristics, which allows to identify Learning Organizations. This will be pursued in Chapter 8 with the help of questionnaires.





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### 7.2. Japanese Sources of the Learning Organization's Characteristics for the Car Component Suppliers Interviewed

The exploratory interviews which were conducted with the six companies gave some indications about the sources of the Learning Organization's characteristics. As has been explained in Chapter 6, there were different ways of learning from Japanese companies: either directly from Japanese car assemblers or car component suppliers, or indirectly from sources which have learnt from Japanese companies in the car industry, as, for example, supplier associations, consultants or some forms of British learning initiatives.

#### 7.2.1. Direct Japanese Sources as Indicated in the Interviews

Firstly, a closer analysis was conducted of the different types of direct sources of learning from Japanese companies in the car industry, and these were tested in Hypothesis 2.

Table 7.2 below shows an overview of the different forms of Japanese companies as direct sources, as they have been indicated by the car component suppliers interviewed.

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**Table 7.2: Japanese Companies as Direct Sources of Suppliers'**  
Characteristics of the Learning Organization as Established  
through the Interviews

<b>Com- pany</b>	<b>Japanese Car Assembler(s) (Customer)</b>	<b>Japanese Supplier(s) (Customer)</b>	<b>Japanese Supplier(s) (Owner)</b>	<b>Japanese Supplier(s) (Partner)</b>	<b>Japanese Supplier(s) (Supplier)</b>
<b>A</b>	3		1		
<b>B</b>	2	1			
<b>C</b>	1	1			
<b>D</b>					
<b>E</b>	3				
<b>F</b>	1			3	

Note: The numbers show the amount of different Japanese companies indicated.

**Company A** had a Japanese components supplier as a parent company. This takeover had been encouraged by management because market competition became more intense in the late eighties. This new ownership helped to gain new customers in the long run, such as Honda, Toyota and Suzuki.

The organizational double-loop learning process for Company A was mainly facilitated by the Japanese parent company, a large car component supplier, which organized extensive exchange of personnel in both directions. The Japanese customers were convinced that this method of teaching would be sufficient and decided that Company A did not need their help to learn.

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“Being part of [name of the Japanese supplier, who was the parent company] pushed this learning along. We all recognised that the Japanese are very, very good at going out in the world and picking up what other people are doing.”,

said the first manager interviewed from Company A.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

At the site where the interview took place there were about 10 seconded Japanese workers plus about 4 to 5 other Japanese staff who were spending a short-term period at Company A during their business trips from overseas. People from this company were sent to Japan or America, where the Japanese parent company had a similar facility to the newer of the two facilities at Company A. The other manager of Company A said that the parent company

“gave me a lot of contacts around the world, where I could develop ideas from.”

The diffusion process from old to new system was not easy. In order to facilitate the change, particular emphasis was placed on communication: management talked a lot to the employees, established training courses and held briefing sessions. The second manager of Company A put it into the following words:

“We did things gradually, so like small improvements, rather than big steps.”

And he concluded that there was always an awareness with regards to trying to achieve increased productivity and increased quality.

Company A's parent company took staff from Company A to various other sites of the parent company world-wide and encouraged them to meet with as many people as possible. The parent company also sent a lot of employees to Japan or to the United States to make contact with other people there. Maintenance personnel, fitters and electricians from Company A went to Japan.

“If there is a need for it and a benefit to [parent company's name] and whoever it is, goes.”,

said the second manager. When the construction of the new factory started, two team leaders, two section leaders and one production leader followed by two fitters and two electricians spent three months in Japan, working on the line with resident staff and then spent three months in North America. Through this work experience, employees from Company A became familiar with the equipment and the systems of their Japanese parent company. Since that time, a lot of other employees have been to Japan or the United States.



## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

“Things changed, we actually found more value from our American sister company”,

concluded the second manager after comparing the two. The reason was mainly communication, as not many Japanese speak English. There were two identical plants to the one in Britain, belonging to the parent company: one in Japan and one in America. Therefore, the employees from Company A had the opportunity of picking up ideas from plants which were exactly the same. However, the preferred way of learning was from Japan via America. This was because it took twice as long with an interpreter to learn in Japan, and because the Americans had already adapted those things from Japan, which could not simply be copied but needed modifications. or vice versa!

The exchange of information was seen to be going in both direction by the managers, but the impression gained from the interview and the factory tour was that the dominant direction was from overseas to Britain.

To conclude from these interviews, the role of learning from the Japanese via their North American plants plays an important role in the knowledge transfer, which sometimes can be even more important than the direct transfer from Japan (cf. also Mair 1994: 279-97).

**Company B** had two Japanese car assemblers as customers, which could have been sources of the Learning Organization's characteristics.

One of the two car assemblers, Toyota, was directly supplied with parts by Company B, not only in the UK, but also in Japan. The manager interviewed commented on this relationship as follows:

“Working with them [Toyota] over the last 5 to 6 years now, since 1989, and we had to visit them quite considerably in the early days, this gained quite an insight in how they operated and how far we were behind them.”

The other car assembler, Nissan, was only indirectly supplied with car parts via a Japanese direct supplier, i.e. who supplied directly to Nissan. However, because of a good personal relationship and because of the way the parts were designed, there was also a close relationship between Nissan and Company B.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

Notwithstanding, there was a good supplying relationship with the Japanese direct supplier as well. An example of this relationship is given by the manager:

“We were out there this week on pre-production control systems, which was how to improve production trials.”

Examples of learning systems taken from Japanese companies were the 5S housekeeping system, in order to clean the shopfloor and keep it tidy, as well as the ILU skills matrix system, in order to train the people in different steps according to the company's needs.<sup>90</sup>

**Company C** had the opportunity to learn directly from Honda, as a Japanese car assembling customer as well as from a Japanese direct supplier, who was based in Great Britain. Things learnt were, e.g., VA/VE techniques (value added/value engineering) or waste watch techniques (wastes of time and material are recorded and their improvement is discussed).

The manager of Company C described the difference in the initial negotiation process between Honda and VW (the latter of which was described as doing adversarial purchasing taken to a fine art):

“Honda's approach would be different: ‘We're going to buy that!’ And so we have a fair discussion about what application is being used and so on and we look at alternatives. Then you put your costs in. Their inquiry hasn't gone to four or five other people, they only send the enquiries along. And then they would put VA/VE [value added/value engineering] teams in the group. They will try to improve cost structures or processes.”

A similar procedure was performed with a Japanese direct supplier based in Great Britain. Company C had a 100% of their business, which is an example of single-sourcing.

“They have a VA/VE team with our engineering and manufacturing people and see what we can do”,

said the manager. And he continued with some examples of learning:

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<sup>90</sup> For more detail about 5S see Osada 1991, or for ILU see Part 4 of the Appendix.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

“Maybe they change the specification of material, which saves 10% of the material costs. Maybe they will look at automating the feed and saving some money there. So they work with you, it’s a hard process, but it’s not confrontation, it’s not adversarial.”

The manager also said that the Japanese companies try to work with you in a team to enable the supplier to learn. A team consists of two to three employees from the Japanese company and two to five employees from Company C. The following examples were given:

“Maybe they want to have the machinery moved around, the conveyors, or something else. There don’t need to be enormous problems.”

Company C’s manager recalled the process of establishing the relationship:

“It takes a long time before establishing a relationship. They tend to survey the possible suppliers, they maybe sample the prices, and they maybe come around and visit you, and just look at you. You don’t know whether you get any business. And maybe what they’re going to say is: ‘That is the company we want to work with.’ And they maybe give you one or two sorts of sample or trial, just to see how you perform and how you react. And then, if that seems to be OK, then they will give you some more orders, and then they will bring in the VA/VE people. And they say: ‘On the first two orders we gave you, we think you can do better than that.’ So it’s afterwards, they don’t put that effort in until they’ve decided that they selected the company.”

These two examples show that Company C was able to learn from Japanese companies. However, this required substantial effort and patience, which might not have occurred with other companies put in the same situation.

**Company D** was the only one interviewed, which had no direct contact with Japanese companies in the form of customers, owners, partners or suppliers. However, there were some indirect sources for learning, which will be described in the following section.



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**Company E** supplies three Japanese car assemblers, Toyota, Nissan and Isuzu. They are supplied inside and outside Japan.

The manager interviewed remembered:

“With Nissan, when they opened the factory here in the UK we thought this was our - because we were not supplying Nissan when they opened their factory here - opportunity to break into Nissan. As it turned out we started to supply Nissan in Japan.”

Normally parts from Company E were assembled in Japan and imported as complete units. This meant limited opportunities for Company E because they could not assemble the parts they delivered themselves, according to the manager. He declared:

“We have always fulfilled their standards in terms of quality and performance of the product.”

The manager was not aware of much team support from Japanese car customers. However, as company E has had a sales and technical centre in Japan for at least 20 years, staffed with Japanese nationals, it might be hard to judge over such a long period how much was actually learnt.

“We would always, if we had the opportunity, look to learn from other organizations, but I wouldn’t say it’s exclusively Japanese”,

the manager from Company E also stated. This learning could also include Company E’s suppliers:

“We have always had people that had gone to look at our suppliers. Two ways really, one, to look how they do things so that we could perhaps help them to improve and, two, looking to see how they do things that maybe we could also learn from them.”

However, comparing it to Company E’s customers he admitted:

“What we tend to do more is, perhaps, go to our customers and look how they are, because our customers have many similar processes and practices. Most customers, because we have got long-term business relationships, would have some difficulties in explaining why they shouldn’t help us to improve ourselves,

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

because they are putting us under enough pressure to reduce our costs.”

**Company F** supplies Honda as a Japanese car producer, and, apart from that, has co-operation with three Japanese car component suppliers in Japan, which are predominantly technology agreements, including licensing and training.

This meant that there was a continuous exchange of people in both directions. This was described by the manager interviewed as follows:

“We formed relationships with Japanese companies and learnt very much from them. We have exchanged visits and we’ve bought [manufacturing] facilities from them and we’ve worked very closely over recent years.”

He explained that the partners, also suppliers to Honda, were part of the Honda family. And he described the co-operation in more detail:

“We requested to visit to discuss with a view to buying technology from them, and we formed relationships with those companies. They are companies that make similar products for Honda, but don’t compete directly with us in Europe, because they do not have a European base. So we formed relationships with those companies, and they supported us on several projects since.”

Of the three partnerships with Japanese car suppliers, two were strong in the form of technical agreements. The manager explained:

“Technical agreement means that they will support us with their technology and know-how. It means that we send personnel to Japan for training and they have sent people across here to help train our people, and they help make improvements.”

The manager himself had been in Japan 15 or 16 times, normally for one or two weeks, mainly for meetings with Honda or one of the technical partners, which was for talks and discussions on process planning. He visited the shopfloor on many occasions, but never to work on the shopfloor. Some of the operators and maintenance staff from Company F have been out for a longer period of training of maybe four weeks.

The impressions of Company F’s manager were as follows:

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

“My learning is mainly done by talking, exchanging views and debating different ways of doing things, and understanding their philosophy and explaining our philosophy. So we have a very good exchange. . . . I think their attention to detail impressed me considerably and they simplify things very much. I think sometimes, certainly in the UK, we tend to overcomplicate things, they tend to make a basic strategy and they stick to that strategy and make things very simple - attention to detail.”

Concerning Honda's relationship with Company F the manager interviewed compared it to the relationship it had with Rover:

“Honda is much more paternal, I think, than Rover. Honda, although they demand continuous improvement and reduction in cost, they work much more together to help to develop. And I don't think Rover has quite gone as far as Honda as they like to think in that area. I think they still very much beat the table and use competitive pressure by getting quotations from different suppliers.”

He specified this by explaining:

“I wouldn't like to say that Honda is a soft option, but it seems to be more partnership, more paternal and more logical sometimes than pure dogmatic 'you must reduce the cost and I don't care how you do it', as Rover has done. Whereas Honda is always looking for improvements, and there is a great deal of pressure, but they don't want it necessarily to be just taken off the profit margin, and end up with a supplier that makes loss and maybe go out of business.”

He described the help of Honda in a different way:

“I think it depends on the supplier, it is case by case. If they think the supplier needs some assistance in developing their process then they will put experts in, who develop that process.”

Honda has been at Company E for many times, and Company E's technical partners joined in best practice exercises in trying to reduce waste and cost.



## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

“They are also interested in cost down ideas - design cost down. So they look for proposals, they look for anything rather small that may improve the cost or the quality”,

he concluded his explanations. Therefore, it appears that Honda’s approach was more conducive than Rover’s for the learning of Company E. One major feature of Honda’s teaching techniques appears to be bringing its suppliers in Britain together with its suppliers from Japan, in some form of technical co-operation relationship.

In summary, there are different ways of learning directly from Japanese companies in the car industry.

Company A represents learning from a Japanese supplier as a parent company in Japan as well as in America.

Companies B and C had the opportunity to learn from Japanese car assemblers as well as from Japanese direct suppliers, both as customers.

Company D did not have the chance to learn directly from a Japanese company in the automotive industry.

Company E supplied three Japanese car assembling customers, but claimed not to have too much learnt from them.

Company F learnt from one Japanese car assembler and three suppliers to this car assembler in Japan as co-operating partners.

Altogether, there is some indication that direct intensive learning of car component suppliers in Great Britain from Japanese car companies takes place.

### 7.2.2. Indirect Japanese Sources as Indicated in the Interviews

There are also other indirect ways of learning from Japanese companies in the car industry, indicated in Table 7.3 below. With this form of indirect knowledge transfer, some of its content is diluted, which particularly applies to the complex transfer-process of implicit knowledge. This, however, plays an important role in the acquisition of the Learning Organization’s characteristics.

The indirect sources indicated in the interviews are as follows:

will then be tested against JS directly to test Hypothesis 2?

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(1) *Supplier associations*, common in Japan, which are becoming increasingly popular in Great Britain. (2) *Consultants*, who normally have predominantly explicit knowledge about the Learning Organization's characteristics that is gathered from various explicit sources (e.g., from books, seminars, etc.). (3) *Learning initiatives*, launched by the British Department of Trade and Industry, also seem to provide the basis for explicit learning. Therefore, even when they imply short contact with Japanese companies, learning initiatives will still be regarded as indirect sources.

**Table 7.3:** Indirect Sources of Characteristics of the Learning Organization as Indicated by the Suppliers Interviewed

Com- pany	Supplier Association	Con- sultants	Learning from Japan Initiative	Lean Benchmark Project
<b>A</b>	X			
<b>B</b>		X	X	
<b>C</b>		X		
<b>D</b>	X	X		X
<b>E</b>	X			
<b>F</b>				

**Company A** is a member of the Yorkshire Automotive Group, which was founded in 1992 and has around 14 members. It is an informal group, which meets about six times a year and consists of automotive industry manufacturers. There are two representatives from every company, one responsible for manufacturing and one for the commercial side. No company is in the same market as there are no direct competitors in West Yorkshire.

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

In the beginning, Company A thought that it could not learn very much from the other suppliers. However, in practice it had turned out that Company A learnt a lot from other companies. For example, on absenteeism, where Company A had problems, one of the other members had a particularly low rate of absenteeism (below 1%), and Company A tried to copy the methods that had been employed successfully. This was regarded as a kind of benchmarking. The meetings take place at a different plant every time and include a factory visit, where the suppliers acquire new ideas, e.g., depicting absenteeism on a chart.

As the companies are very different, different subjects are chosen. The manager interviewed said:

“We did it because it seemed to be a good idea. We did it because we felt we could learn even from unlikely places. Skill and expertise can be found in the most unlikely places.”

**Company B** was participating in the “Learning From Japan Initiative”. This is a two-year programme that started in September/November 1993. It was a DTI initiative, where 12 companies were chosen after a pre-selection by Japanese car assemblers in Great Britain, i.e. Nissan, Honda and Toyota, that were already doing business with them (this means that there was no control group of companies available, who did not do any business with Japanese assemblers previously, in order to compare the effects). The benchmarking of suppliers in Japan and Great Britain was done by an external consultancy.

The interviewed manager of Company B stated:

“We are a lot better informed now than we had been before, and I think a lot of that is due to the Japanese Initiative [Learning From Japan Initiative]. . . . Communication is a big thing - is a definite thing - that has come out the Japanese Initiative, and we realized that we didn’t communicate at all what we should have been doing. And we now have a completely different communication structure prior to the Japanese Initiative.”

However, he also admitted:



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“We are sure it does not work a hundred per cent, but it works a hell of a lot better than when we first set out.”

Company B has a daily briefing session every morning for 10 minutes, which is supposed to be passed down to every employee within 24 hours so that it catches every shift pattern. There are also monthly reports and meetings, quarterly information sessions on how the company is performing and where it is going. In addition, there are bi-annual and annual meetings. There is no company newsletter, but presentations of about two hours by selected employees of the company will be written down.

Four employees from Company B have been to Japan: the Managing Director and Production Director in February 1994 for about a fortnight, the interviewed manager together with one of the prospective team leaders in November 1994 for 10 days. 12 other companies were also involved in the visit to Japan as part of the “Learning From Japan Initiative”, most were visiting companies similar to themselves. There is still a dissemination and cross-fertilisation of ideas, because the 12 companies are supposed to visit each other to see how they are progressing and if they can use any of the ideas implemented by others.

“Some companies may have learnt more than others from that”,

said the interviewed manager, because the actual placement of the 12 companies in terms of world-class (i.e. best in the world) would show a progression as some are better than others.

Upon a question regarding the source of learning he claimed:

“We definitely learnt more from the Japanese [than from the other 11 companies involved].”

And the importance of the Learning from the Japan Initiative for Company B was again mentioned during the factory tour when the manager concluded:

“A lot of these visuals, and things like that, have come on board since the Japanese Initiative. Probably the biggest benefits we have seen are in communication, visual displays. The information, which is actually moving around is a hell of a lot

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better than it used to be. We were probably a bit naive about information in the first place.”

**Company C** received some training from an outside consultant in 1991, which can be regarded as a possible indirect source of the Learning Organization’s characteristics. The consultant stayed for three weeks and went to other companies in the group as well. The consultant was described as “good value for money”. He had worked with Harley Davidson in the USA and with a variety of companies in the UK before.

All Company C’s employees received a minimum of 10 hours off-the-job training and education about total quality, starting with the basics about what TQM is, and then going on to the basics of how it works: team work, problem analysis, fishbone diagram, etc.

The room for continuous improvement teams showed frequent use. Compared with statements from managers of other companies this seemed to be a implementation that worked. However, it cannot be said whether this was due to the consultant only, or if it could be related to the multi-causal influences of Japanese car companies and component suppliers together with the consultant, which sounds more plausible.

**Company D** was a member of a supplier association, had some consultants at its site and had taken part in “The Lean Benchmarking Project”. The latter was funded by the Government and performed by joint consultancy and university research. It compared selected companies from Britain and Japan with each other (for more details cf. Andersen Consulting 1993).

Company D could not directly learn from Japanese companies through personal contact, but it could see its own position compared to Japanese companies in Japan. The benchmarking itself was confidential, so no learning on the tacit level was possible among the companies participating in the “The Lean Benchmarking Project”.

One of the two managers interviewed commented:

“The results of the first [benchmarking] were quite obvious differences of 100 to 1 on quality and so on. That showed us really that we were way behind many of these world-class companies. We weren’t the worst - far from it. Surprisingly we thought our quality was very good and the productivity was not

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so good. The study suggested that our productivity was quite good, but our quality wasn't quite good. So it was interesting."

And he concluded:

"I think it stems from the fact, if you took it from the point of reference, the quality assessments made by our customers, Ford and General Motors. As you are aware, they don't adopt the sorts of standards that perhaps Toyota adopts, in term of parts per million, they still think in terms of percentages. That was the spur, and from there we tried to establish a way forward, and we were very careful not to adopt some sort of magic formula solution."

This shows that the benchmarking study was somehow helpful to start a learning process for Company D (although some managers of the company doubted the benchmark figures, such as quality and productivity, in the first instance). However, there was no easy way to embark on a journey towards the Learning Organization. One method employed was the contracting of consultants, which was described like this:

"We involved some consultants at the end of 1992. Unfortunately, they had this prescriptive approach. In a sense this prescriptive approach reinforced the Western managers' typical conceptions to act - relationships to be the cause and effect relationships; in fact there isn't such direct relationship."

This indicated how complex the knowledge of the "right way" was perceived to be by management, which might be an indicator for the perception that tacit knowledge cannot easily to be transferred by consultants alone, who have limited knowledge of the Learning Organization. This was also shown by other statements such as:

"One of the problems that we since experienced, it is with any organizational change, there are - it's not an analytical process - there are political dimensions and educational dimensions, and these were not considered by consultants at the time. We were for ourselves in a sense learning as we perceive."

And an example for the problems was given:



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“In a sense, they raise the expectations, these expectations were subsequently dashed by the fact that we had questions like: ‘What happens when kaizen or continuous improvement results in processes capable of operating with fewer people what happens to the other people?’ It’s all these things one might expect.”

The membership of a supplier association was described as not very inspiring. This is because the lead of the supplier association was taken by a consultancy which recommended that the clients take some training provided by the same consultancy. However, Company D had already either done this kind of training or did not perceive to need it.

So, the learning process for Company D from Japanese companies was indirect and not always easy, as the manager stated:

“Although we are not supplying to Toyota, we use Taichi Ohno’s concepts of waste production and continuous improvement. We have done for example fast interchange of dies, we are looking at total productive maintenance, again all part of the Toyota Production System. There are some areas where we are particularly weak, and we think we can gain from looking at other companies.”

The manager also envied other car component suppliers which were supplying Toyota:

“And one of the advantages to work for a world-class customer like Toyota is they force you to be better.”

**Company E** was a member of a supplier association, organized by Rover.

“With Rover we are a part of the network. So I went to a meeting a few weeks ago to launch a new network and there were ten suppliers”,

explained the manager interviewed. And he continued:

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

“It is just UK supplier base and they try to get a mixture of different types of supplier base so that there are no competitors in the same group.”

The supplier network was not regionally based like other supplier associations in Britain, explained the manager, who said:

“The idea of the network is to identify areas where we have problems with Rover and where they should improve their systems and processes. And [we participating suppliers] try to identify areas where we could work with each other to improve ourselves.”

There was no indication of participating Japanese companies.

**Company F** did not have any indirect sources for learning from Japanese companies at all. But, as shown above, it had many direct sources.

In summary, it can be concluded from this analysis that indirect sources of knowledge do play a role in reality. ~~However, compared to direct sources of knowledge their significance might be low.~~ *In reality he's not tested this well*

### 7.3. Conclusions Drawn from the Exploratory Interviews

These six exploratory interviews suggested in the first section that the ten characteristics of the Learning Organization appear to be observable to a varying extent at car component suppliers in Great Britain. Therefore, it makes sense to explore the characteristics in greater detail in the questionnaire analysis of the Hypotheses 1 and 2.

These exploratory interviews helped to focus not only on improvement systems as an important element of research, but also on differentiating between team improvement and employee suggestion systems. Furthermore, the rewards for organizational learning are also distinguished between being financial and non-financial nature.

The second section suggested that the direct way of acquiring the characteristics of the Learning Organization from some of the Japanese car companies or suppliers seems to be the most effective one (which would support Hypothesis 2). Whether this predominantly tacit knowledge about the Learning Organization's characteristics could be learnt indirectly from

## 7. ANALYSIS OF THE EXPLORATORY INTERVIEWS

assumes Ts = only source!

non-Japanese transmitters might be doubtful, as the tacit part seems to be at least as important as the explicit part.

The next chapter will deal with these issues in more detail with the help of the analysis of questionnaires from car component suppliers in Britain.



### 8. Data Analysis of the Questionnaire

In order to refine the empirical approach of this thesis, exploratory interviews with car component suppliers have been presented in Chapter 7. These exploratory interviews focused on the measures of organizational learning, characteristics of Learning Organizations and their sources.

This chapter describes the process of the second step of the empirical research of this thesis, which is based on a comprehensive questionnaire survey. The responses of the seventy questionnaires were examined and interpreted with the help of correlation and regression analyses. The advantage of using these two methods is that correlation analysis is more sensitive, as it can be used for testing one directional (one-tailed) relationships, whereas regression analysis is able to measure the combined impact of different variables through multiple regression analysis.

The first question to be subjected to statistical data analysis is: in what way do the ten characteristics of the Learning Organization affect the organizational capacity to learn and consequently lead to organizational learning outcomes?

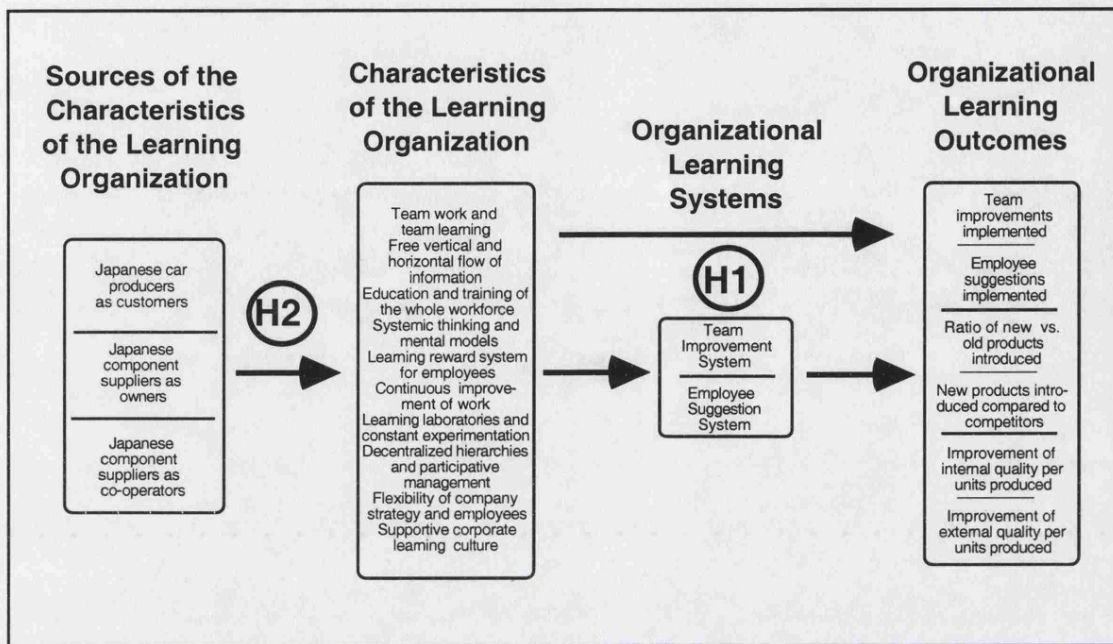
The research model is depicted in Figure 8.1. It shows the assumed direct influence of the characteristics of the Learning Organization (independent variables) on the organizational learning outcomes (dependent variable), indicated with a “H1” for Hypothesis 1.

The second research question is: in what way does the presence of Japanese companies in the car industry contribute to the degree to which the characteristics of the Learning Organization can be found at direct car component suppliers in Britain?

Figure 8.1 shows the assumed direct influence of Japanese companies (independent variable) on the characteristics of the Learning Organization (dependent variables), indicated with a “H2” for Hypothesis 2.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

Figure 8.1: Assumed Impact of the Hypotheses 1 and 2 (H1 & H2)



This chapter is divided into three sections. The first section explains the method of data collection and the attributes of the sample, the second section analyses Hypothesis 1 and the third section reports the results of the analysis of Hypothesis 2.

### 8.1. Method of Data Collection and Sample Attributes

This section explains the method used to collect data employing a questionnaire as well as the general attributes of the sample.

#### 8.1.1. Method of Data Collection

The "Questionnaire for Suppliers" (see Section 1 of the Appendix for the questionnaire and Chapter 6 for its design) was sent to direct car component suppliers with manufacturing sites in Great Britain, which were delivering components directly to car assemblers. A list of nearly 650

*not really disturbed*

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

companies was compiled from various sources, such as car producers<sup>91</sup> and trade associations in Great Britain (e.g., SMMT<sup>92</sup> Buyers' Guide 1993).

After piloting the questionnaire design, questionnaires were sent out from late May to July 1995 to mainly either the Managing Directors or Plant Managers, but later also Human Resources/Personnel Managers, Training Managers or Quality Managers, if the former's responses were not available, as the latter were anyhow often delegated to answer the questionnaires.

From the 642 supplier companies, which had received a questionnaire, 75 returned them, of which 70 were usable for data analysis. These 70 questionnaires, which could be employed for empirical analysis, constituted a usable response rate of 11% ( $= 70/642 \cdot 100$ ). Most of the missing data in some questionnaires, which were essential for analysis, were completed with the help of telephone calls and faxes. This was not possible with three questionnaires that had been completed anonymously.

At the time of the questionnaire mail-out in 1995, there were no accurate statistics about the population of car component suppliers in Britain that directly supplied car manufacturers (not to speak of the suppliers that actually produce in this country and not only distribute). But, the actual population was not of major concern for the purpose of this research, which was more aimed at empirical testing of a newly-designed theoretical model.

However, in 1998, the SMMT started to publish "The UK Motor Industry Directory 1998", which had sufficient information to identify about 400 car component producers that assemble in Britain and directly supply car manufacturers. This population is considerably lower than the original sample of this thesis, as it was possible to exclude suppliers of machinery and software as well as of engineering and prototyping, both not being actual *car component* suppliers. As both groups were not the research target of the questionnaire, they did not complete it. If the population of this 400 car component producers would have been used, the adjusted response rate would have been lifted to 17.5% ( $= 70/400 \cdot 100$ ).

<sup>91</sup> The names of the car assemblers are not disclosed for reasons of confidentiality.

<sup>92</sup> SMMT = Society of Motor Manufacturers and Traders Ltd., London.



*I thought I didn't need to mention*

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

The next section also shows that, with regard to turnover and employees, the 70 responses were statistically not significantly different from the overall population. This means that the sample can be seen as being representative for all those car component producers in Britain that supply to car manufacturers directly.

Altogether, 70 questionnaires was seen as being sufficient for the purpose of this research. This was also the case because of the analysis of the questionnaires having been combined with exploratory interviews beforehand and in-depth interviews afterwards.

The next sub-section presents the general data of the questionnaire about the car component companies and looks at their representativeness.

### 8.1.2. Descriptive Statistics of the Sample

The general descriptive data of the 70 car component suppliers who responded to this survey are presented in this subsection. If a company had more than one production site, the questionnaire asked the respondent to answer the questions only with respect to the production site to which the questionnaire was sent.

Firstly, the descriptive statistics of the size in terms of sales turnover in 1994 is shown in Table 8.1. The smallest company or site (which cannot be distinguished from the questionnaire) had a turnover of only £140,000, whereas the largest had a turnover of £160 million. The average sales turnover was £30 million.

Table 8.1: Turnover of the 70 Component Suppliers (1994, in million £)

Mean:	Median:	Minimum:	Maximum:	Valid cases: <sup>93</sup>
30	15	0.14	160	51

<sup>93</sup> Mean is the mathematical average of all numbers of the group. Median is the value in the middle of the group. Valid cases are the number of companies which indicated a turnover figure usable for this table.

*need to explain this?*

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

Secondly, the descriptive statistics of the size in terms of the number of employees in 1994 are shown in Table 8.2. The smallest company or site had only six employees and the largest 2,300 employees. The average number of employees was 377 staff.

Table 8.2: Number of Employees of the 70 Component Suppliers (1994)

<b>Mean:</b>	<b>Median:</b>	<b>Minimum:</b>	<b>Maximum:</b>	<b>Valid cases:</b>
377	200	6	2300	68

Thirdly, the descriptive statistics of the founding years of the 70 car component suppliers are shown in Table 8.3. The oldest company or site was founded in 1740, whereas the youngest one was founded in 1994. The mean year of foundation was 1955 and the median year was 1969.

Table 8.3: Founding Years of the 70 Car Component Suppliers

<b>Mean:</b>	<b>Median:</b>	<b>Minimum:</b>	<b>Maximum:</b>	<b>Valid cases:</b>
1955	1969	1740	1994	60

Lastly, how representative is this sample in terms of the values turnover and employees compared to the population in SMMT's UK Motor Industry Directory?

From the population of roughly 400 car component producers that directly supply car manufacturers, 327 valid cases were listed in terms of turnover and 366 valid cases in terms of employees. The hypothesis suggests that there is a difference between the population values and the sample values, thus the null hypothesis would suggest that there is no difference. To reject the null hypothesis for a two-tailed test, *Z critical* would be  $> +1.65$  or  $< -1.65$  at an alpha level of 0.10. The *Z* score is computed by the formula of  $Z = (\text{mean of sample} - \text{mean of population}) / (\text{standard deviation of population} / \sqrt{\text{number of valid sample cases}})$  (cf. Healey 1993: 177-199).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

Surprise - there are statistically significant differences! huge

For *turnover* the Z obtained is - 0.51 ( $= (30m - 36.6m) / (92.8m / \sqrt{51})$ ),  $S.D.$  which is not smaller than -1.65 (Z critical), thus the null hypothesis cannot be rejected. This means that there is no statistically significant difference between the turnover of the sample and the population as a whole.

For *employees* the Z obtained is - 0.22 ( $= (377 - 399) / (833 / \sqrt{68})$ ), which is not smaller than -1.65 (Z critical), therefore the null hypothesis cannot be rejected. This means that there is no statistically significant difference between the employees of the sample and the population.

As the data of the values in the questionnaire originates from 1994 and the data from SMMT's "The UK Motor Industry Directory 1998" is from 1997, it makes sense to adjust the latter data set to 1994 and check whether there is a significant difference in outcome. According to the Global Automotive Group of Standard & Poor's DRI (1998), UK car manufacturing increased by an average of 5% p.a. between 1994 and 1997.

Assuming that this had about the same impact on suppliers' turnover and employees, i.e. both growing by 5% p.a. over the three year period and adjusting them for that time period, the picture does not look much different for failing to reject the null hypothesis (the Z obtained is - 0.14 for turnover (mean: 31.5m) and 0.38 for employees (mean: 344)).

employees growing ?? (strong assumption)

Altogether, the sample values turnover and employees of the 70 suppliers that responded were statistically not significantly different from the overall population. This means with regard to turnover and employees the questionnaire sample can be regarded as representative for the population of car component producers in Britain that directly supply car manufacturers. Testing of further values for representativeness (like e.g., type of component) was not possible due to a lack of data available.

In summary, this section described the method of data collection with the help of the questionnaire as well as the sample attributes and representativeness of the completed questionnaires.

The next section deals with the empirical analysis of the first hypothesis of this thesis.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

### 8.2. Analysis of the First Hypothesis

This section examines in what ways the ten characteristics of the Learning Organization affect the capacity of organizations to engage in organizational learning, and whether these characteristics lead to desirable organizational learning outcomes. Thus, the first hypothesis was designed to test the impact of the characteristics of the Learning Organization on the performance in organizational learning (see also Chapter 6).

**Hypothesis 1:** Car component suppliers in Britain that show higher scores in the characteristics of the Learning Organization have better organizational learning outcomes.

The first Hypothesis was analysed by splitting it into Hypothesis 1A, 1B and 1C (see Figure 8.2 below). This was done because it was assumed that the impact of the characteristics of the Learning Organization on the outcomes of organizational learning is not only of a direct nature (Hypothesis 1B), but also of an indirect nature via organizational learning systems<sup>94</sup> (Hypothesis 1A and 1C). This intermediate variable could either take the form of a team improvement system, an employee improvement system or both.

These three hypotheses were as follows.

**Hypothesis 1A:** Those car component suppliers in Britain who show higher scores in the *characteristics of the Learning Organization* have *organizational learning systems* for team improvements and/or employee suggestions.

**Hypothesis 1B:** Those car component suppliers in Britain who show higher scores in the *characteristics of the Learning Organization* have better *organizational learning outcomes*.

**Hypothesis 1C:** Those car component suppliers in Britain who employ *organizational learning systems* have better *organizational learning outcomes*.

This research approach of Hypothesis 1 is depicted in Figure 8.2.

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<sup>94</sup> See Chapter 6.3.3.1. for more details about organizational learning systems.

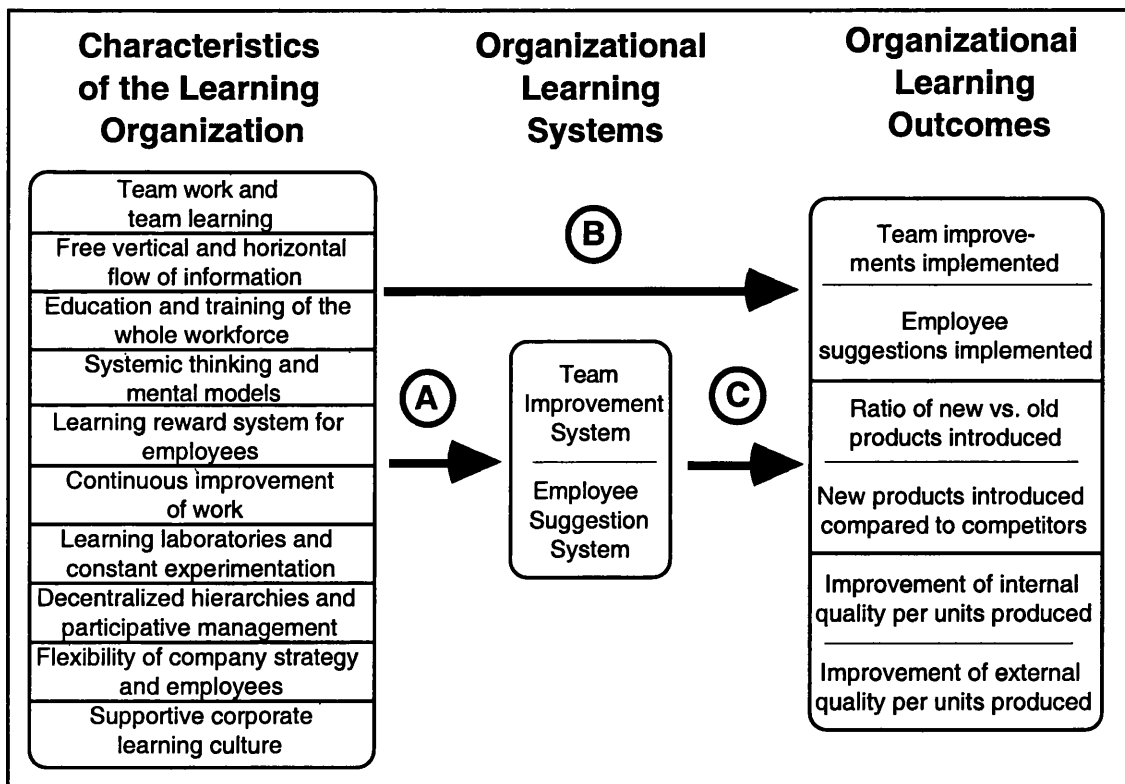
## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

It shows the assumed direct influence of the characteristics of the Learning Organization (independent variables) on the organizational learning systems (dependent variable), which is indicated with an “A”.

The direct influence of Learning Organization’s characteristics (independent variables) on organizational learning outcomes (dependent variable) is indicated with a “B”.

And the direct influence of organizational learning systems (independent variable) on organizational learning outcomes (dependent variable) is indicated with a “C”.

**Figure 8.2: Hypothesised Impact of the Learning Organization’s Characteristics on Organizational Learning Systems and Outcomes**



The split of Hypothesis 1 generated Hypotheses 1A, 1B and 1C, which were then transformed into corresponding null hypotheses for testing, i.e. the hypotheses are converted to enable its rejection (cf. also Popper 1959).

The selected methods to examine the hypothesised relationships were correlation analysis and regression analysis, which are presented in this

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

order. As stated at the beginning of this chapter, the advantage of using both methods is that correlation analysis is more sensitive, as it could be used for testing one directional (one-tailed) significant relationships, whereas regression analysis is able to measure the combined impact of different variables together through multiple regression analysis.

The null hypotheses were judged according to the level of significance of correlation and regression coefficients, through one-tailed correlation analysis and through regression analysis.

The null hypotheses were generally rejected when the significance level “p” was smaller than 0.1. This means that “ $p < 0.1$ ” indicated a weakly significant rejection (a significance at the 10% level was marked with “\*”), “ $p < 0.05$ ” indicated a significant rejection (a significance at the 5% level was marked with “\*\*”) and “ $p < 0.01$ ” indicated a strongly significant rejection (a significance at 1% level was marked with “\*\*\*”).

Additionally, the number of valid cases were indicated by an “n”. Generally, correlation coefficients were indicated by an “r” and regression coefficients by a “bc” (cf. Bühl & Zöfel 1994: 237-86, Healey 1993: 253-477, SPSS/PC+ Base Manual 1990: B95-135, SPSS/PC+ Statistics 4.0 1990a: B15-216 and Kähler 1993: 140-75, 284-317).

The items which were used to test the first hypothesis are explained in the following sub-section.

### 8.2.1. Items for Empirical Analysis of the First Hypothesis

The constructed variables, which have been operationalized in the questionnaire, are explained in more detail below.

Firstly, the ten characteristics of the Learning Organization were operationalized. In order to assess to what degree a particular characteristic of the Learning Organization exists, constructs, each derived from a set of observable items, were developed for the questionnaire.

Then, indicators measuring the organizational learning outcomes were developed, in order to gauge which organizations perform better than others in terms of organizational learning.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

### 8.2.1.1. Statistical Description, Analysis and Composition of the Ten Characteristics of the Learning Organization

Nine of the ten characteristics of the Learning Organization (independent variables) were measured in an ordinal scale (ranking scale) from 1 to 5, with 1 being at the low end and 5 being at the top end of the scale.

The ten characteristics were generated by adding their items together and dividing them by the number of items from which they were constructed, in order to standardize them on a scale from 1 to 5. Then they were all tested for reliability by Cronbach's Alpha (cf. Kähler 1993: 312f). An exception was made with the constructed characteristic "team work and team learning", because it was measured in numbers of teams on a *cardinal scale* (metric scale) (cf. also Bamberg & Bauer 1989: 7). However, in order to approximate an *ordinal scale* (ranking scale) from 1 to 5, the variable was standardized (from 0 to 5) by adding the occurrences of the six different forms of teams together, giving each form of team a score of one, except cross-functional or cross-hierarchical teams, which were given a value of 0.5, in order to adjust for combined cross-functional and -hierarchical teams.

It was decided not to apply any weighting to the different characteristics of the Learning Organization. This was because this thesis could not draw on any validated experience from previous studies. Furthermore, the absence of weighting was intended to help in the process of empirically distinguishing the importance of the different characteristics.

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it

The ten characteristics of the Learning Organization were constructed in the questionnaire (see Part 1 of the Appendix) as follows:

- (1) "Team work and team learning" with six items (see I.2.).
- (2) "Free vertical and horizontal flow of information" with seven items (see II.2.).
- (3) "Education and training of the whole workforce" with thirteen items (see III.2.).
- (4) "Systemic thinking and mental models" with eight items (see IV.1.).
- (5) "Learning reward system for employees" with six items (see V.1.).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

- (6) “Continuous improvement of work” with twelve items (see VI.3.).
- (7) Learning laboratories and constant experimentation” with nine items (see VII.1).
- (8) “Decentralized hierarchies and participative management” with eleven items (see VIII.1.).
- (9) “Flexibility of company strategy and employees” with eight items (see IX.1.).
- (10) “Supportive corporate learning culture” with fifteen items (see X.1).

These ten characteristics of the Learning Organization were tested for reliability with the help of the Cronbach’s Alpha, as shown in Table 8.4.

A Cronbach’s Alpha coefficient of 0.6 was selected to be an adequate threshold for the reliability testing of variables, which are constructed from different items (cf. also SPSS/PC+ Statistics 4.0 1990a: B187-199).

Cronbach’s Alpha coefficient was above 0.6 for all ten characteristics of the Learning Organization, most of which were even above 0.8, and, therefore, all ten variables passed the reliability criterion (see Table 8.4).

**Table 8.4: Reliability Testing of the Ten Constructed Variables (Characteristics) with the help of Cronbach’s Alpha Coefficients**

<b>No (Items)</b>	<b>Variable (Characteristic)</b>	<b>Reliability</b>
1 (6)	Team work and team learning	- 1
2 (7)	Free vertical and horizontal flow of information	0.802
3 (13)	Education and training of the whole workforce	0.902
4 (8)	Systemic thinking and mental models	0.695
5 (6)	Learning reward system for employees	0.650
6 (12)	Continuous improvement of work	0.841
7 (9)	Learning laboratories and constant experimentation	0.820
8 (11)	Decentralized hierarchies and participative management	0.831
9 (8)	Flexibility of company strategy and employees	0.791
10 (15)	Supportive corporate learning culture	0.850

<sup>1</sup> Not measured on an ordinal scale.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

The descriptive statistics of the ten characteristics of the Learning Organization are presented in Table 8.5. It shows the mean, i.e average, (range: 0 to 5), the standard deviation (range: 0 to 2.5), the maximum (range: 5 to 0), the minimum (range: 0 to 5) and the number of valid observations “n” (range: 0 to 70).

**Table 8.5:** Descriptive Statistics for the Constructed Variables  
(Ten Characteristics of the Learning Organization)

No (Items)	Variable	n
1 (6)	<b>Team work and team learning<sup>1</sup></b> Mean: 2.96 St. Dev.: 1.53 Min.: 0.00 Max.: 5.00	70
2 (7)	<b>Free vertical and horizontal flow of information</b> Mean: 3.79 St. Dev.: 0.57 Min.: 2.71 Max.: 5.00	70
3 (13)	<b>Education and training of the whole workforce</b> Mean: 3.22 St. Dev.: 0.79 Min.: 1.00 Max.: 4.92	69
4 (8)	<b>Systemic thinking and mental models</b> Mean: 3.41 St. Dev.: 0.51 Min.: 2.25 Max.: 4.75	69
5 (6)	<b>Learning reward system for employees</b> Mean: 2.72 St. Dev.: 0.71 Min.: 1.00 Max.: 4.33	70
6 (12)	<b>Continuous improvement of work</b> Mean: 3.42 St. Dev.: 0.67 Min.: 2.08 Max.: 4.91	70
7 (9)	<b>Learning laboratories &amp; constant experimentation</b> Mean: 2.92 St. Dev.: 0.76 Min.: 1.00 Max.: 4.22	69
8 (11)	<b>Decentr. hierarchies &amp; participative management</b> Mean: 3.80 St. Dev.: 0.06 Min.: 1.72 Max.: 5.00	70
9 (8)	<b>Flexibility of company strategy and employees</b> Mean: 3.29 St. Dev.: 0.60 Min.: 1.37 Max.: 4.75	68
10 (15)	<b>Supportive corporate learning culture</b> Mean: 3.22 St. Dev.: 0.55 Min.: 2.13 Max.: 4.66	67

<sup>1</sup> Not measured on an ordinal scale. Instead, a ranking scale was developed to approximate an ordinal scale from 1 to 5. The variable was standardized by dividing the number of teams by the number of employees. Then, the 70 valid cases were classified into a ranking scale.

n = number of valid cases, items = number of items used to construct a characteristic

*3  
correct*



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

*All treated (weighted as equal  
doesn't reflect qualitative a  
very complex  
theoretical model*

Each of the ten different characteristics of the Learning Organization (already sets of variables) were purposely developed previously to be analysed individually. Thus, there was no need to do a factor analysis of these characteristics (cf. also SPSS/PC+ Statistics 4.0 1990a: B126 for purpose of factor analysis).

However, the ten characteristics of the Learning Organization were combined by adding to an overall “scale of the ten Learning Organization’s characteristics”, which was tested for reliability.

The outcome of the analysis of the scale of the ten Learning Organization’s characteristics was a Cronbach’s Alpha coefficient of 0.80 ( $n = 64$ ). This was more than acceptable, as the threshold of reliability testing with Cronbach’s Alpha coefficients was again suggested to be at least at a level of 0.6.

The descriptive statistics of the “scale of the ten Learning Organization’s characteristics” are shown in Table 8.6.

**Table 8.6:** Descriptive Statistics for the “Scale of the Ten Learning Organization’s Characteristics”

Variable	n
<b>Scale of the ten Learning Organization’s characteristics</b>	<b>64</b>
Mean: 32.9 St. Dev.: 4.6 Min.: 21.9 Max.: 45.1	

n = number of valid cases

A correlation matrix was computed, in order to show the positive inter-correlation between the ten different Learning Organization’s characteristics in the research sample (see Table 8.7).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.7:** Correlation Matrix of the Characteristics of the Learning Organization

charac- teristic	1	2	3	4	5	6	7	8	9	10
1	1.000									
2	- .000	1.000								
3	0.342	0.273	1.000							
4	0.140	0.525	0.455	1.000						
5	0.091	0.101	0.266	0.341	1.000					
6	0.373	0.407	0.614	0.581	0.386	1.000				
7	0.238	0.157	0.378	0.462	0.482	0.501	1.000			
8	0.156	0.399	0.432	0.612	0.367	0.542	0.505	1.000		
9	0.296	0.425	0.387	0.371	0.107	0.354	0.312	0.544	1.000	
10	0.168	0.439	0.339	0.516	0.141	0.504	0.313	0.513	0.511	1.000

Note: For key of number (No) of characteristics see Table 8.5.

This correlation matrix showed that, except for the first characteristic, “team work and team learning”, there is a positive correlation of around 0.4 among the different characteristics, as expected in the theoretical discussions at the beginning of this thesis.

86?

An explanation for the reason that the variable “team work and team learning” had some very low correlation coefficients compared to the other nine characteristics might be the fact that it was not measured on an ordinal scale, but on a cardinal scale (although it was converted into a ranking scale in order to approximate an ordinal scale from 1 to 5).

Having presented the construction of the ten Learning Organization’s characteristics, the next step is to look at the six indicators of organizational learning outcomes.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

### 8.2.1.2. Statistical Description, Analysis and Composition of the Six Indicators of Organizational Learning Outcome

The indicators measuring the existence of and the degree to which organizational learning outcome exists, consisting of three groups of two measures each.

new style

These three groups measuring the outcome of organizational learning were (a) “team improvements implemented per employee” and (b) “employee suggestions implemented per employee” in the first group, (c) “ratio of new products introduced compared to existing ones” and (d) “new products introduced compared to competitors” in the second group, and (e) “improvement of internal quality per units produced” and (f) “improvement of external quality per units produced” in the third group<sup>95</sup>.

The first group of organizational learning outcomes, the **amount of individual learning which turned into organizational learning** was measured in two different ways. The first was (a) “team improvements implemented” and the second was (b) “number of suggestions per employee”. Both measures were analysed in three separate years in order to see the developing trend. This means that each of the three items (for the three different years: 1990, 1992 and 1994) were divided by the current number of employees in order to be standardized for comparison.

The variable (a) “team improvements implemented per employee” was generated by the following question and items, which was divided by the number of employees:

- How many continuous improvement team projects did you implement? in 1990: _____ in 1992: _____ in 1994: _____ O Not counted.
---

The variable (b) “employee suggestions implemented per employee” was gauged by the following question and items, which then was divided by the number of employees. This was finally multiplied with the percentage share of suggestions implemented, in order to measure the successful implementation:

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<sup>95</sup> Whereas the former measures the product quality during the production process inside the company, the latter measures the quality of the products in terms of customer rejects or producer recalls.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

- How many employee suggestions for continuous improvement were generated?

in 1990: \_\_\_\_\_ in 1992: \_\_\_\_\_ in 1994: \_\_\_\_\_ O Not counted.

- What percentage of all these suggestions was implemented?

in 1990: \_\_\_\_\_ % in 1992: \_\_\_\_\_ % in 1994: \_\_\_\_\_ % O Not counted.

In the order of the years 1990, 1992 and 1994, the number of valid cases for companies with implemented continuous team improvements were 23, 33 and 43; and the corresponding company figures for implemented employee suggestions were only 12, 16 and 22.

**Table 8.8:** Descriptive Statistics for "Team Improvements Implemented per Employee" and "Employee Suggestions Implemented per Employee"

No	Variable	n
(a)	<b>Team improvements implemented per empl. in 1990</b>	23
	Mean: 0.01 St. Dev.: 0.02 Min.: 0.00 Max.: 0.08	
	<b>Team improvements implemented per empl. in 1992</b>	33
	Mean: 0.03 St. Dev.: 0.05 Min.: 0.00 Max.: 0.24	
	<b>Team improvements implemented per empl. in 1994</b>	43
	Mean: 0.06 St. Dev.: 0.14 Min.: 0.00 Max.: 0.81	
(b)	<b>Employee suggestions impl. per employee in 1990</b>	12
	Mean: 0.03 St. Dev.: 0.09 Min.: 0.00 Max.: 0.30	
	<b>Employee suggestions impl. per employee in 1992</b>	16
	Mean: 0.04 St. Dev.: 0.07 Min.: 0.00 Max.: 0.24	
	<b>Employee suggestions impl. per employee in 1994</b>	22
	Mean: 0.74 St. Dev.: 3.18 Min.: 0.00 Max.: 15.00	

n = number of valid cases

The second group of organizational learning outcomes, **speed of organizational learning**, showed how fast an organization has been able to learn with the help of individual and team learning. The measures of these outcomes were (c) "ratio of new products introduced compared to

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

existing products” and (d) “new products introduced compared to competitors”.

The variable (c) “ratio of new products introduced compared to existing ones” was developed from three items. These were the percentages of new products compared to old ones developed within one year, two years or four years. The question looked like this:

2. What percentage of **your products** in the market are newer than . . .  
a) one year? \_\_ %.    b) two years? \_\_ %.    c) four years? \_\_ %.

The variable (d) “new products introduced compared to competitors” was tested with a five point scale ranging from 1 (later) over 3 (same time) to 5 (earlier), for which the following question was asked:

3. At what stage does your company **introduce new products** compared to direct competitors? Choice:  
1 (later) - 2 (a bit later) - 3 (same time) - 4 (a bit earlier) - 5 (earlier)

can  
HR  
never  
arrive  
to?

The number companies with valid cases for “new products which were newer than one year” was 56, “. . . than two years” was 58 and “. . . than four years” was 55.

For “new products introduced compared to competitors” there were 56 valid cases.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.9:** Descriptive Statistics for “Ratio of New Products Introduced Compared to Existing Products” (in %) and “New Products Introduced Compared to Competitors”

No	Variable	n
(c)	<b>Ratio of new compared to existing products: 1 year</b>	56
	Mean: 14.1 St. Dev.: 13.6 Min.: 0.0 Max.: 50.0	
	<b>Ratio of new compared to existing products: 2 years</b>	58
	Mean: 29.3 St. Dev.: 21.9 Min.: 0.0 Max.: 100.0	
	<b>Ratio of new compared to existing products: 4 years</b>	55
	Mean: 54.8 St. Dev.: 29.4 Min.: 0.0 Max.: 100.0	
(d)	<b>New products introduced compared to competitors</b>	56
	Mean: 3.66 St. Dev.: 1.03 Min.: 1.00 Max.: 5.00	

n = number of valid cases, Mean: 14.1 = 14.1% of the products are new on average

The third group of organizational learning outcomes, the **extent of improvements in quality** was measured with the help of the change of internal and external quality in 1990, 1992 and 1994. This group was divided into the variables (e) “improvement of internal quality per units produced” and (f) “improvement of external quality per units produced”.

The items, measuring percentage improvement in quality, were generated by subtracting the newer failure rate from the older failure rate, i.e. the value of 1992 from 1990, 1994 from 1992 and 1994 from 1990, and then calculating the percentage of this difference with the older year’s number as a basis<sup>96</sup>.

The variable (e) “improvement of internal quality per units produced”<sup>97</sup> was measured by three items in the following question:

4. How was your overall product quality in terms of . . .

<sup>96</sup> The fact is acknowledged that companies on a high quality level cannot improve in the same way as a company which starts at a low level of quality. However, there were no indications for a significant bias.

<sup>97</sup> This means product quality during the production process inside the company. According to the questionnaire’s questions this included work-in-progress as well as off-line products.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

(note: - a 'unit' can be a part, a square metre, etc.; example: 4 u.p. 1.000 (u.p. = units per)  
- if you do not measure your quality, please indicate with 'N/M' (= not measured))

a) first-pass yield (= number of units (specify: \_\_\_\_\_) which did not pass through the production process without being scrapped or reworked)

in 1990: \_\_ u.p. \_\_\_\_\_ in 1992: \_\_ u.p. \_\_\_\_\_ in 1994: \_\_ u.p. \_\_\_\_\_

The sixth and last variable (f) "improvement of external quality per units produced"<sup>98</sup> was measured by three items through the following question:

4. How was your **overall product quality** in terms of . . .

b) units shipped to customers which were rejected or recalled

in 1990: \_\_ u.p. \_\_\_\_\_ in 1992: \_\_ u.p. \_\_\_\_\_ in 1994: \_\_ u.p. \_\_\_\_\_

The number of valid cases of companies for 1990/92, 1992/94 and 1990/94 were 20, 29 and 20 for first-pass yield quality (here: numbers of units which did not pass through the production process without being scrapped or reworked) and 18, 27 and 19 for the units shipped to customers which were rejected or recalled.

*meaning only these  
cos. reported any results?  
What to make of this?*

<sup>98</sup> This measures the quality of the products in terms of customer rejects or producer recalls.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.10:** Descriptive Statistics for “Improvement of Internal Quality per Units Produced” and “Improvement of External Quality per Units Produced” (both changes in %)

No	Variable	n
(e)	<b>Improvement of int. quality per units prod. 1990/92</b>	20
	Mean: 26.7 St. Dev.: 22.0 Min.: 0.0 Max.: 66.7	
	<b>Improvement of int. quality per units prod. 1992/94</b>	29
	Mean: 28.1 St. Dev.: 44.2 Min.: -150.0 Max.: 80.0	
	<b>Improvement of int. quality per units prod. 1990/94</b>	20
	Mean: 40.6 St. Dev.: 52.5 Min.: -150.0 Max.: 90.0	
(f)	<b>Improvement of ext. quality per units prod. 1990/92</b>	18
	Mean: 37.4 St. Dev.: 30.0 Min.: 0.0 Max.: 100.0	
	<b>Improvement of ext. quality per units prod. 1992/94</b>	27
	Mean: 38.4 St. Dev.: 48.4 Min.: -150.0 Max.: 100.0	
	<b>Improvement of ext. quality per units prod. 1990/94</b>	19
	Mean: 51.0 St. Dev.: 57.0 Min.: -150.0 Max.: 100.0	

n = number of valid cases, Mean: 26.7 = quality improved by 28.1% on average

The three groups of six indicators of organizational learning outcome were introduced in this part. The next part deals with organizational learning systems.

### 8.2.1.3. Statistical Description, Analysis and Composition of Organizational Learning Systems

This research model includes a variable for organizational learning systems. Its existence is measured by the items “team improvement system” and “employee suggestion system”, which were included in the data analysis as a combined variable, but sometimes also as separate variables in more detailed analysis.

The combined variable was called “organizational learning system”, and was defined by the existence of at least one of the variables “team

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

improvement system” or “employee suggestion system”<sup>99</sup>. This means that the variable “organizational learning system” takes a value of “1” if either a “team improvement system” or an “employee suggestion system” exists. If neither system is found with a company the value “0” is accorded. This dichotomous approach has also allowed a separate comparable analysis of team improvement systems and employee suggestion systems.

The item “team improvement system” was gauged by the following question:

- Do you employ continuous improvement project teams?
- ☐ No ☐ Yes, since 19 \_\_\_\_.

And the item “employee suggestion system” was asked for as follows:

- Has your company installed an employee suggestion system?
- ☐ No ☐ Yes, the latest version was introduced in 19 \_\_\_\_.

The descriptive statistics show that “organizational learning system” had the highest overall mean of 0.87 (it applied to 61 of the 70 suppliers with either a “team improvement system” and/or an “employee suggestion system”). “Team improvement system” was second with a mean of 0.79 (indicated by 55 companies positively and 15 negatively) and “employee suggestion system” with 0.43 was last (marked positively by 30 companies).

---

<sup>99</sup> A non-dichotomous variable (which would indicate either a 2 if both systems exist together, a 1 if either of the system exists and 0 otherwise) was not generated, as it would automatically assume that the more organizational systems the better. In-depth interviews revealed that most companies, which introduced a team improvement system, abandoned their employee suggestion system in the first instance (but most of them intended to reinstall it as a revised system at a later stage).



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.11:** Descriptive Statistics for “Organizational Learning System”, “Team Improvement System” and “Employee Suggestion System”

Code	Variable	n
OLS	<b>Organizational Learning system</b> Mean: 0.87 St. Dev.: 0.34 Min.: 0.00 Max.: 1.00	70
TIS	<b>Team improvement system</b> Mean: 0.79 St. Dev.: 0.41 Min.: 0.00 Max.: 1.00	70
ESS	<b>Employee suggestion system</b> Mean: 0.43 St. Dev.: 0.50 Min.: 0.00 Max.: 1.00	70

n = number of valid cases (i.e. with and without an organizational learning system)

In summary, this was the introduction of the three sets of variables, which were used to test the first hypothesis.

There are three parts in the following statistical analysis of the first hypothesis.

The first part of the statistical analysis of the first hypothesis deals with the impact of the Learning Organization’s characteristics on organizational learning systems.

The second part deals with the impact of the Learning Organization’s characteristics on the organizational learning outcomes.

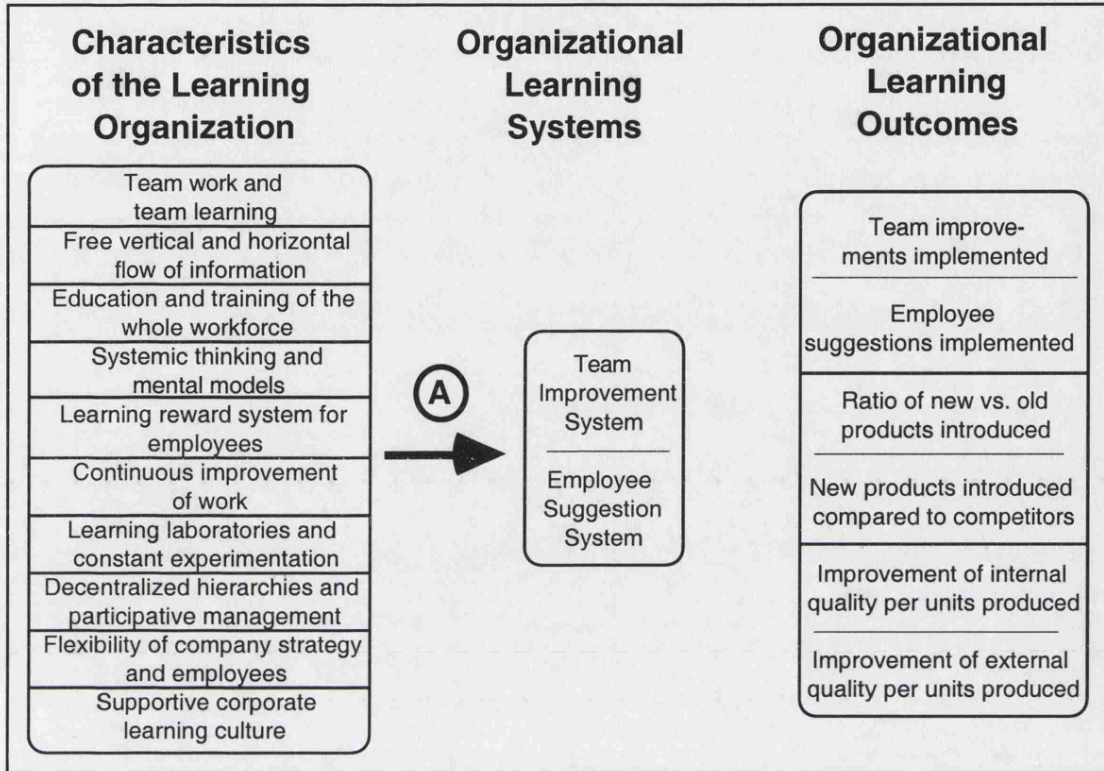
The third part deals with the impact of organizational learning systems on the organizational learning outcomes.

### 8.2.2. Statistical Analysis of Hypothesis 1A

The first part of the statistical analysis of Hypothesis 1, i.e. testing of Hypothesis 1A, was accomplished by measuring the impact of “the scale of the ten characteristics of the Learning Organization” (independent variable) on “organizational learning systems” (dependent variable) (see Figure 8.3).

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**Figure 8.3:** Hypothesised Impact of the Learning Organization's Characteristics on Organizational Learning Systems



As mentioned previously, the research starts with correlation analysis.

### 8.2.2.1. Correlation Analysis of Hypothesis 1A

The first hypothesis to be examined (converted to a null hypothesis for empirical testing) is the following.

**Null Hypothesis 1A:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization have no organizational learning systems for team improvements and/or employee suggestions.

**Null Hypothesis 1A** could be rejected, as the correlation coefficient of “the scale of the ten Learning Organization’s characteristics” with the dependent variable “organizational learning systems” was strongly significant with an  $r$  of  $0.383^{***}$  ( $p = 0.001$ ,  $n = 64$ ).

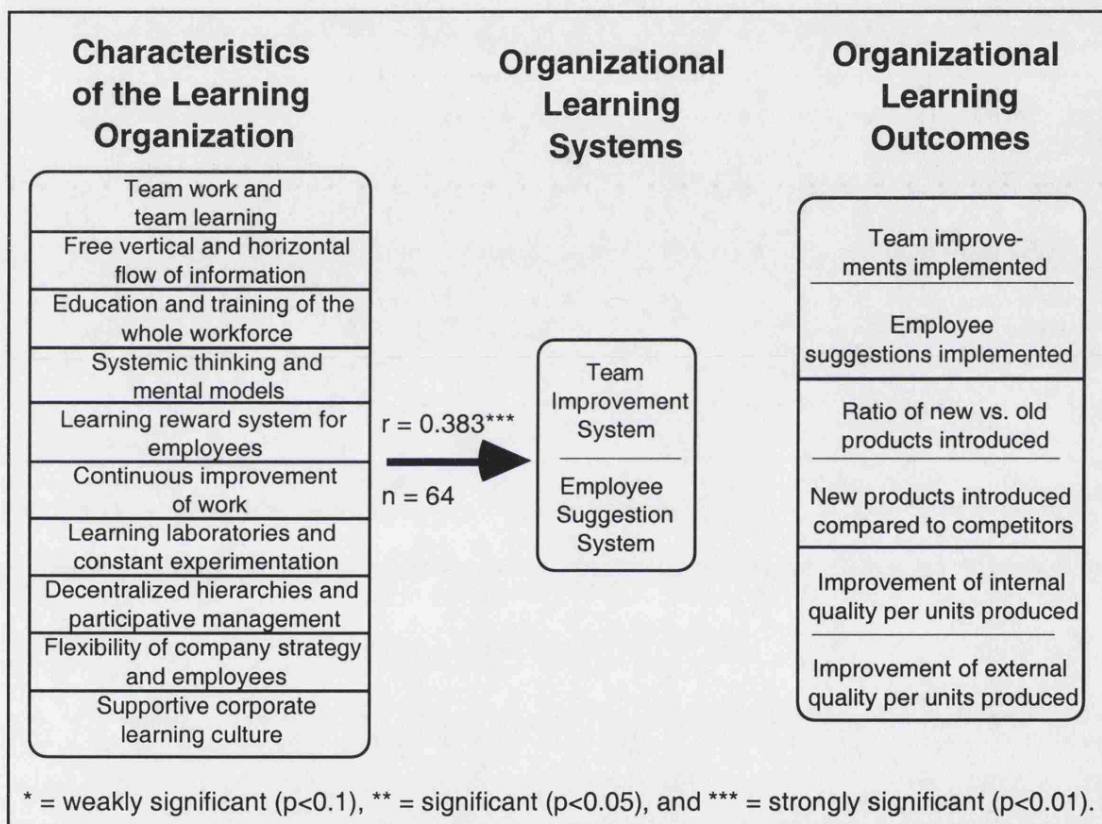
*hardly surprising,  
they're so  
close  
conceptually &  
= practice!*



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

Consistent with the theoretical argument of this thesis, this correlation is interpreted as an impact of the independent variable “the ten Learning Organization’s characteristics” on the dependent variable “organizational learning systems”. This finding and interpretation will be corroborated by the in-depth interviews in Chapter 9.

**Figure 8.4: Correlation Analysis: Impact of the Learning Organization’s Characteristics on Organizational Learning Systems**



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

A closer look at the organizational learning systems revealed that the correlation coefficients of “the scale of the ten Learning Organization’s characteristics” with “continuous team improvement systems” was strongly significant, with an  $r$  of  $0.430^{***}$  ( $p < 0.001$ ,  $n = 64$ ), whereas it was not significant for “employee suggestion systems”, with an  $r$  of  $0.046$  ( $p = 0.358$ ,  $n = 64$ ). This showed that the ten Learning Organization’s

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## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

characteristics play a much more important role for the former compared to the latter.

This finding was consistent with the impressions gained from various interviews: car component suppliers which introduced continuous team improvement systems normally abolished employee suggestion systems, as these had not worked properly in the past. Team improvement systems appeared to need enough characteristics of the Learning Organization, in order to be installed and continue existing, whereas employee suggestion systems did not appear to need these characteristics. The implementation rates for employee suggestion systems indicated a relatively poor performance for those still in place (e.g., a mean of 37% in 1994 (standard deviation: 30%, minimum: 0%, maximum: 90%, n: 15)). Chapter 9 will go into greater detail of this issue with the help of in-depth interviews.

Null sub-hypotheses were derived from Null Hypothesis 1A for a more detailed insight into the various Learning Organization's characteristics.

**Null Hypothesis 1A.1-10:** Those car component suppliers in Britain who show higher scores in each of the ten characteristics of the Learning Organization have no organizational learning systems.

The analysis of these ten null sub-hypotheses of Hypothesis 1A, that test the influence of each of the ten Learning Organization's characteristics on organizational learning systems was done with the help of correlation analysis in the first instance. Derived from the theoretical argument, the correlation coefficients were interpreted as an impact of the independent variables on the dependent variables, as explained above.

The results of the correlation analysis of the null sub-hypotheses of Hypothesis 1A are shown in Table 8.12 below. The results of this sub-null hypotheses testing show that for at least nine out of the ten characteristics of the Learning Organization it holds true that a high scores in the characteristics of the Learning Organizations correlates with the existence of organizational learning systems, which is interpreted as a positive impact.

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**Table 8.12:** Outcome of Testing of Constructed Variables for Significant Correlation of Hypothesis 1A

*change Ns  
here*

No (Items)	Variable	r	n
1 (6)	Team work and team learning	0.173*	70
2 (7)	Free vertical and horizontal flow of information	0.064	70
3 (13)	Education and training of the whole workforce	0.390***	69
4 (8)	Systemic thinking and mental models	0.345***	69
5 (6)	Learning reward system for employees	0.362***	70
6 (12)	Continuous improvement of work	0.402***	70
7 (9)	Learning laboratories and constant experimentation	0.318***	69
8 (11)	Decentralized hierarchies and particip. management	0.179*	70
9 (8)	Flexibility of company strategy and employees	0.191*	68
10(15)	Supportive corporate learning culture	0.198*	67

\* = weakly significant ( $p < 0.1$ ), \*\* = significant ( $p < 0.05$ ), and \*\*\* = strongly significant ( $p < 0.01$ ).

r = correlation coefficient, n = number of valid cases

*sure?*

**Null Hypothesis 1A.1** could be rejected, because the independent variable “team work and team learning” showed a significant correlation with the dependent variable “organizational learning systems”. The interpreted impact was weakly significant, as the correlation coefficient r had a value of 0.173\* ( $p = 0.076$ ,  $n = 70$ ).

**Null Hypothesis 1A.2** was not rejected, as the independent variable “free vertical and horizontal flow of information” showed no correlation with the dependent variable “organizational learning systems”. The correlation value of r with 0.0645 was not significant ( $p = 0.298$ ,  $n = 70$ ).

**Null Hypothesis 1A.3** had to be rejected, as the dependent variable “education and training of the whole workforce” had a strongly significant effect on “organizational learning systems”, with a correlation coefficient of 0.390\*\*\* ( $p < 0.000$ ,  $n = 69$ ).

**Null Hypothesis 1A.4** had to be rejected as well, as the characteristic “systemic thinking and mental models” had a strongly significant impact on the dependent variable “organizational learning systems”, with an r of 0.345\*\*\* ( $p = 0.002$ ,  $n = 69$ ).



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**Null Hypothesis 1A.5** had to be rejected, because “learning reward system for employees” had a strongly significant impact on “organizational learning systems”. The correlation coefficient  $r$  was  $0.362^{***}$  ( $p = 0.001$ ,  $n = 70$ ).

**Null Hypothesis 1A.6** had to be rejected, as the impact of “continuous improvement of work” on “organizational learning systems” was strongly significant, with a correlation coefficient of  $0.402^{***}$  ( $p < 0.000$ ,  $n = 70$ ).

**Null Hypothesis 1A.7** had to be rejected as well, as the correlation of “learning laboratories and constant experimentation” had a strongly significant impact on “organizational learning systems”, with a strongly significant  $r$  of  $0.318^{***}$  ( $p = 0.004$ ,  $n = 69$ ).

**Null Hypothesis 1A.8** could be rejected, because the independent variable “decentralized hierarchies and participative management” had a weakly significant impact on the dependent variable “organizational learning systems”. The correlation coefficient of  $0.179^*$  was only weakly significant ( $p = 0.068$ ,  $n = 70$ ).

**Null Hypothesis 1A.9** could be rejected as well, because “flexibility of company strategy and employees” had a weakly significant impact on “organizational learning systems”, at the nearly significant  $r$  of  $0.191^*$  ( $p = 0.059$ ,  $n = 68$ ).

**Null Hypothesis 1A.10**, last but not least, could be rejected as “supportive corporate learning culture” had a weakly significant impact on “organizational learning systems”. The correlation coefficient  $r$  was  $0.198^*$  ( $p = 0.054$ ,  $n = 67$ ) and, therefore, again close to being significant.

*was - not significant?*

Taking a closer look at the insignificant correlation revealed an interesting deeper insight into the nature of the construct “free horizontal and vertical flow of information”. It was split into its items again for investigation of its properties. But none of the items showed any significant impact on the variable “organizational learning systems”.

Further investigation tried a new construction of the characteristic “free vertical and horizontal flow of information” for a new Null Hypothesis 1A.2, this time with different items. The problem of the items about information and communication was that they were focusing on the



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way information was transferred, and not on what was transmitted through information and communication.

Therefore, a new independent variable was constructed from those five items, which asked about the kind of information that was disclosed in the company. This could be information about five areas such as financial performance, quality performance or productivity performance, as well as production plans or investment plans

ok

Then, Null Hypothesis 1A.2 was tested again with a newly-constructed independent variable for “free vertical and horizontal flow of information”.

**New Null Hypothesis 1A.2:** Those car component suppliers in Britain who show higher scores in “free vertical and horizontal flow of information” have no organizational learning systems.

The **new Null Hypothesis 1A.2** could be rejected this time, as the newly constructed independent variable “free vertical and horizontal flow of information” showed a significant correlation with the dependent variable “organizational learning systems”. Thus, it showed a significant influence ( $r = 0.207^{**}$ ,  $p = 0.045$ ,  $n = 68$ ) on the variable “organizational learning systems”.

Furthermore, when the **new Null Hypothesis 1A.2** was only applied to the item “team improvement system”, it was rejected because of a strongly significant influence ( $r = 0.317^{***}$ ,  $p = 0.004$ ,  $n = 68$ ), whereas it had no significant influence on “employee suggestion system” at all ( $r = 0.045$ ,  $p = 0.255$ ,  $n = 68$ ). This again fits with the impression from the factory visits, which showed that information was used to keep the wheel of continuous team improvement systems going, but not necessarily for employee suggestion systems.

✓

This renewed analysis shows that it has been advisable to focus research more on the content than on the mode of “free horizontal and vertical flow of information”. A further reason for the difference in impact between the two could be that the questions about information content are harder to indicate wrongly in the questionnaire than about the mode of information flow.

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In summary, with the help of the theoretical argument, the correlation analysis of the Learning Organization's characteristics showed a significant impact on the dependent variable "organizational learning systems". The impact of "the scale of the ten Learning Organization's characteristics" proved to be strongly significant with an  $r$  of 0.383\*\*\* ( $p = 0.001$ ,  $n = 64$ ). This means that the degree to which the characteristics of a Learning Organization exist plays an important role for the existence of organizational learning systems, however, more for continuous team improvement systems and less for employee suggestion systems. Later on, the in-depth interview analysis also underlines this point, by showing that a lack of organizational learning characteristics leads to a failure in successful implementation of organizational learning systems.

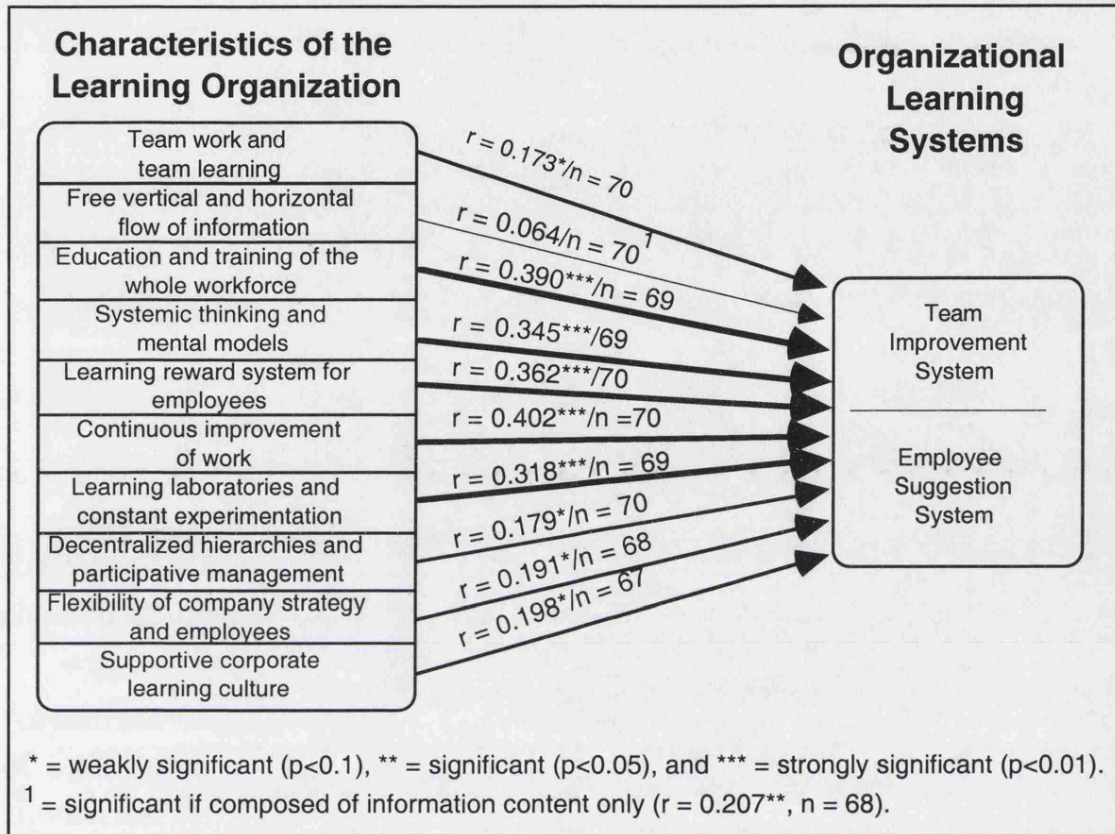
The impact of the ten separate characteristics of the Learning Organization is summarised again in Figure 8.5 below. With the help of slight modification of its composition, the initial problem in the validity of the second characteristic could be overcome. Amongst others, this problem was due to the lack of questionnaire-based studies on Learning Organizations, which could have helped in the validity issue from the beginning.

Concluding from the correlation analysis of the different characteristics, in line with the theoretical argument in Chapter 3, it showed that the characteristics "systemic thinking and mental models" ( $r = 0.345***$ ) and "continuous improvement of work" ( $0.402***$ ) both had a strongly significant impact on the dependent variable "organizational learning systems". But this was also the case for "education and training of the whole workforce" ( $r = 0.390***$ ), "learning reward system for employees" ( $r = 0.362***$ ) and "learning laboratories and constant experimentation" ( $r = 0.318***$ ).

However, the multiple regression analysis of Hypothesis 1A in the following part gives a clearer picture about the difference in impact of the ten different characteristics.

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**Figure 8.5:** Correlation Analysis: Impact of the Learning Organization's Characteristics on Organizational Learning Systems in Detail



n = number of valid cases, r = correlation coefficient, p = significance level

### 8.2.2.2. Regression Analysis of Hypothesis 1A

For the regression analysis of Hypothesis 1A, logistic regression analysis was the appropriate regression method. This was because of the dichotomous nature of the combined variable “organizational learning systems”, composed of “team improvement system” and “employee suggestion system” (cf. SPSS/PC+ Advanced Statistics 4.0 1990b: B39-62).

To evaluate the order of importance of the ten different characteristics of the Learning Organization, a detailed logistic regression analysis, including each of the ten characteristics of the Learning Organization, was performed.



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Firstly, the “Goodness of Fit” of the model was analysed. The classification table showed that 93.75% of the companies (n = 64) were correctly classified, i. e. predicted and observed, in the table regarding the variable “organizational learning systems” (see Table 8.13).

**Table 8.13:** Classification Table of “Organizational Learning Systems”

		<b>Predicted</b>		<b>Percent Correct</b>
		<b>0</b>	<b>1</b>	
<b>Observed</b>	<b>0</b>	5	3	62.50%
	<b>1</b>	1	55	98.21%
<b>Overall:</b>				<b>93.75%</b>

This pattern also held true for the last check of the “Histogram of Estimated Probability”, where only “organizational learning systems” showed no cluster in the middle of the scale, which is desirable.

The “-2Log Likelihood” significance level for the variable “organizational learning systems” had a value of 0.998. And the “Goodness of Fit” had a value of 0.123 (see Table 8.14). Both values should not be significant for null hypothesis rejection.

**Table 8.14:** Significance Levels of “Organizational Learning Systems”

	<b>Chi-Square</b>	<b>Degrees of Freedom</b>	<b>Significance</b>
<b>-2 Log Likelihood</b>	26.98	53	0.998
<b>Model Chi Square</b>	21.24	10	0.019**
<b>Improvement</b>	21.24	10	0.019**
<b>Goodness of Fit</b>	65.06	53	0.123

This finding was confirmed by further assessment of the significance of “organizational learning systems” with the “Model Chi-Square”, which showed a value of 0.019\*\*, as well as of the “Improvement”, which showed a value of 0.019\*\*. This time the significance was important for null

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

hypotheses rejections. This means that the variables “organizational learning systems” complied with the test.

In conclusion, the logistic regression analysis with its sub-tests of Hypothesis 1A showed that the ten characteristics of the Learning Organization can be used to predict the existence of organizational learning systems. In detail, this prediction is possible for continuous team improvement systems alone, but not for employee suggestion systems; the reasons for this have already been discussed in the preceding part.

Lastly, all variables in the logistic regression equation are shown in Table 8.15. Only the characteristic (4) “systemic thinking and mental models” had a weakly significant explanatory power with a standardized regression coefficient of 0.146\* for the dependent variable “organizational learning system”.

~~explain, since  
theoretically  
the variables  
are not key,  
- rather  
chapter~~

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**Table 8.15: Logistic Regression of the Ten Learning Organization's Characteristics on Organizational Learning Systems**

<b>Variable (Charact.)</b>	<b>Beta Coeff.</b>	<b>Stand. Error</b>	<b>Wald</b>	<b>df</b>	<b>Signif.</b>	<b>R</b>	<b>Exp(B)</b>
(1) Team work and team learning	-0.227	0.402	0.318	1	0.572	0.000	0.796
(2) Free vertical and horizontal flow of information	-1.513	1.805	0.702	1	0.401	0.000	0.220
(3) Education and training of the whole workforce	1.409	1.015	1.924	1	0.165	0.000	4.092
(4) Systemic thinking and mental models	4.032	2.315	3.031	1	0.081	0.146*	56.395
(5) Learning reward system for employees	0.757	1.108	0.467	1	0.494	0.000	2.133
(6) Continuous improvement of work	1.724	1.694	1.035	1	0.308	0.000	5.607
(7) Learning laboratories and constant experimentation	-0.055	1.265	0.019	1	0.965	0.000	0.946
(8) Decentralized hierarchies and particip. management	-2.499	1.680	2.313	1	0.136	-0.066	0.082
(9) Flexibility of company strategy and employees	0.929	1.475	0.396	1	0.528	0.000	2.533
(10) Supportive corporate learning culture	0.285	1.300	0.048	1	0.825	0.000	1.331
Const.	-10.374	5.579	3.456	1	0.063		

**Note:** Wald = Wald statistic, df = degree of freedom, Signif. = significance of Wald statistics, R = partial correlation, Exp(B) = regression coefficient.

In summary, the multiple logistic regression analysis of Hypothesis 1A showed that only the Learning Organization's characteristic (4) "systemic thinking and mental models" had a significant impact on "organizational learning system". This was in line with the theoretical discussion in Chapter 3.4., which argued that the ability of systemic thinking was the key characteristic for becoming a Learning Organization. However, (6) "continuous improvement of work" does not play the same role here, as the theoretical argument suggested. This outcome from the logistic regression analysis was also more precise than the correlation analysis in the sub-section before.

After the statistical analysis of Hypothesis 1A, i.e. the first part of Hypothesis 1, the next sub-section will deal with Hypothesis 1B.



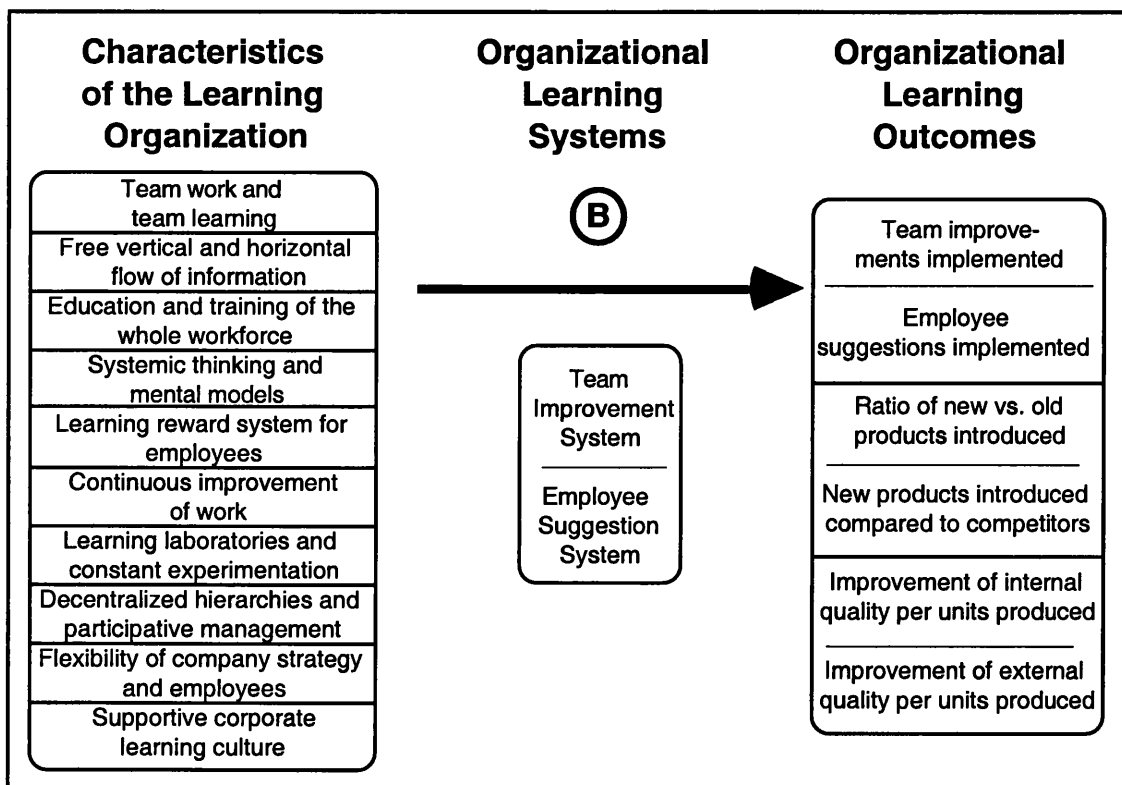
## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

### 8.2.3. Statistical Analysis of Hypothesis 1B

The second part of the statistical analysis of Hypothesis 1 was made by measuring the impact of the ten characteristics of the Learning Organization (independent variable) on organizational learning outcomes (dependent variables) (see Figure 8.6).

The three groups of measures of organizational learning outcome were (a) “team improvements implemented per employee” and (b) “employee suggestions implemented per employee” in the first group, (c) “ratio of new products introduced compared to existing ones” and (d) “new products introduction compared to competitors” in the second group, and (e) “improvement of internal quality per units produced” and (f) “improvement of external quality per units produced” in the third group.

**Figure 8.6:** Hypothesised Impact of the Learning Organization’s Characteristics on Organizational Learning Outcomes



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The correlation analysis of Hypothesis 1B was conducted to gauge the direct impact of the independent variables of the characteristics of the Learning Organization on the dependent variables of organizational learning outcomes.

Hypothesis 1B was tested as a whole, as well as each of the ten sub-hypotheses, for correlation with organizational learning outcome. But before that Hypothesis 1B was translated into a null hypothesis for statistical testing, as well as into the ten sub-null hypotheses.

**Null Hypothesis 1B:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have better organizational learning outcomes.

Analogous to the testing of Hypothesis 1A, the sub-null hypotheses of the ten Learning Organization's characteristics have been analysed. However, in order to keep this chapter short, the sub-null hypotheses will not be repeated for each of the six dependent variables of organizational learning outcome. Furthermore, not significant correlation coefficients of sub-null hypothesis will not be mentioned for the same reason.

**Null Hypotheses 1B.1-10:** Those car component suppliers in Britain who show higher scores in each of the ten characteristics of the Learning Organization do not have better organizational learning outcomes.

Firstly, analysis was conducted with scales that measure the **amount of team and individual learning, which turned into organizational learning.**

These scales were (a) "team improvements implemented per employee" and (b) "employee suggestions implemented per employee". The null hypotheses were as follows.

**Null Hypothesis 1Ba:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have more team improvement projects implemented.

The analysis showed that **Null Hypothesis 1Ba** could be rejected, this was possible in two of the three years. The correlation coefficient between the "Learning Organization's characteristics" variable and the "team improvements implemented per employee" was significant in 1990 with an

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r of 0.392\*\* ( $p = 0.039$ ,  $n = 21$ ) and in 1992 with an r of 0.338\*\* ( $p = 0.034$ ,  $n = 30$ ), but not in 1994 for which an r of 0.206 ( $p = 0.100$ ,  $n = 40$ ) was registered.

**Null Hypothesis 1Bb:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have more suggestions per employee implemented.

Again, **Null Hypothesis 1Bb** could not be rejected, as the variable “Learning Organization’s characteristics” showed only one weakly significant impact on “employee suggestions implemented per employee” which was in 1990 ( $r = 0.504^*$ ,  $p = 0.057$ ,  $n = 11$ ), but no significant impact in 1992 ( $r = 0.174$ ,  $p = 0.267$ ,  $n = 15$ ) and in 1994 ( $r = 0.158$ ,  $p = 0.247$ ,  $n = 21$ ). The number of valid cases was even lower here and, therefore, the outcomes in should be treated with caution.

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The sub-null hypotheses of Null Hypothesis 1Ba could be rejected for seven of the ten Learning Organization’s characteristics alone for 1990 and 1992, and three out of ten for 1994. This impact of varying significance on “team improvements implemented per employee” is shown in Table 8.16.



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**Table 8.16: Correlation Analysis of the Ten Learning Organization's Characteristics on Team Improvements per Employee Implemented**

Sub-null hypothesis	1990		1992		1994	
	r	n	r	n	r	n
1Ba1	0.363**	23	0.059	33	0.046	43
1Ba2	0.486***	23	0.301**	33	- .077	43
1Ba3	0.287*	23	0.366**	33	0.206*	43
1Ba4	0.349*	22	0.282**	32	0.081	42
1Ba5	0.329*	23	0.275*	33	0.337**	43
1Ba6	0.385**	23	0.148	33	0.192	43
1Ba7	- .117	22	0.174	32	0.144	42
1Ba8	0.042	23	0.265*	33	0.286**	43
1Ba9	0.286*	23	0.474***	33	0.124	43
1Ba10	0.167	22	0.282*	31	0.143	41

r = correlation coefficient, n = number of valid cases,

For the key of the characteristics see Table 8.15 above

Compared to “team improvements implemented per employee” (1Ba), the variable “employee suggestions implemented per employee” (1Bb) registered a much less significant impact from the ten different characteristics of the Learning Organization, as shown in Table 8.17.

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**Table 8.17:** Correlation Analysis of the Ten Learning Organization's Characteristics on Employee Suggestions per Employee Implemented

Sub-null hypothesis	1990		1992		1994	
	r	n	r	n	r	n
1Bb1	0.350	12	0.122	16	- .257	22
1Bb2	0.043	12	- .251	16	0.297*	22
1Bb3	0.634**	12	0.346*	16	0.278	22
1Bb4	0.221	12	0.289	16	0.338*	22
1Bb5	0.374	12	0.360*	16	0.363**	22
1Bb6	0.350	12	0.081	16	- .023	22
1Bb7	0.399*	12	0.357*	16	0.361**	22
1Bb8	0.013	12	0.009	16	0.343*	22
1Bb9	0.451*	12	- .094	16	- .161	22
1Bb10	0.026	11	- .147	15	0.239	21

r = correlation coefficient, n = number of valid cases

For the key of the characteristics see Table 8.15 above

Most of the characteristics showed no significant correlation, i. e. the null sub-hypotheses could therefore not be rejected. The few rejections, however, have to be treated with caution, because of the low number of valid cases.

Secondly, **the speed of organizational learning** was investigated, which was measured with the help of (c) "ratio of new products introduced compared to existing products" and (d) "new products introduced compared to competitors".

**Null Hypothesis 1Bc:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have a higher ratio of new products introduced compared to existing ones.

Analysis of **Null Hypothesis 1Bc** revealed only one weakly significant impact of the independent variable "Learning Organization's

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characteristics” on the dependent variable “ratio of new products introduced compared to existing products”.

The correlation coefficients were neither significant for the share of new products introduced within one year ( $r = 0.141$ ,  $p = 0.156$   $n = 53$ ) nor for two years ( $r = 0.059$ ,  $p = 0.111$ ,  $n = 54$ ), but significant for four years ( $r = 0.251^{**}$ ,  $p = 0.036$ ,  $n = 52$ ). This means that the null hypothesis could not be rejected in this case.

**Null Hypothesis 1Bd:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have a quicker product introduction compared to competitors.

Correlation analysis of **Null Hypothesis 1Bd** revealed that it could not be rejected, as no significant effect of “the Learning Organization’s characteristics” on “new products introduced compared to competitors” could be found ( $r = 0.150$ ,  $p = 0.143$ ,  $n = 52$ ).

The direct impact of each of the ten Learning Organization’s characteristics, derived from Null Hypothesis 1Bc, are shown in Table 8.18.

The impact of “team work and team learning” on “ratio of new products introduced compared to existing products” (1Bc1) was weakly significant for the two years average ( $r = 0.196^{*}$ ), but reached the highest level of all correlation coefficients with a strong significance for the four years ( $r = 0.331^{***}$ ).

This significance applied especially to “inter-organizational team work and team learning”, which had a weakly significant impact on the one year average ( $r = 0.192^{*}$ ), two years average ( $r = 0.224^{**}$ ) and a highly significant impact on the four years average ( $r = 0.363^{***}$ ); this was especially the case for teams with customers ( $r = 0.268^{**}/0.339^{***}/0.317^{***}$ ), but also with suppliers ( $r = 0.181^{*}/0.213^{*}/0.391^{**}$ ). No significant correlation could be found between “intra-organizational team work and team learning” and any of the dependent variables; apart from “cross-departmental and hierarchical teams” which showed some significance for the four years average ( $r = 0.273^{**}$ ).

This can be interpreted as follows: the age of the products range of the car component companies was dependent on a product development, which



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included close co-operation with customers, but also with suppliers, through inter-organizational project teams. This would also be in line with observations about product development processes in Japanese car companies, which include their suppliers in new product development (cf. also Womack *et al.* 1990 and Mair 1994).

“Continuous improvement of work” (1Bc6) had a significant impact on “ratio of new products introduced compared to existing products” in all of the three periods ( $r = 0.224^{**}/0.280^{**}/0.236^{**}$ ). It was the only characteristic showing this high degree of impact, demonstrating its importance for new product development. But also “education and training of the whole workforce” (1Bc3) had some considerable direct impact on the new products ratio ( $r = 0.177^{*}/0.211^{*}/0.234^{**}$ ).

**Table 8.18:** Correlation Analysis of the Ten Learning Organization's Characteristics on Ratio of New Products Introduced

Sub-null hypothesis	one year		two years		four years	
	r	n	r	n	r	n
1Bc1	0.129	56	0.196*	58	0.331***	55
1Bc2	0.124	56	0.165	58	0.007	55
1Bc3	0.177*	55	0.211*	57	0.234**	54
1Bc4	0.191	56	0.190*	58	0.167	55
1Bc5	0.005	56	- .194	58	0.237**	55
1Bc6	0.224**	56	0.280**	58	0.236**	55
1Bc7	0.042	56	0.002	58	0.220*	55
1Bc8	- .041	56	- .041	58	- .036	55
1Bc9	- .060	55	- .051	57	0.045	54
1Bc10	0.160	54	0.177*	55	0.050	53

r = correlation coefficient, n = number of valid cases,  
for the key of the characteristics see Table 8.15 above

The sub-null hypothesis of Null Hypothesis 1Bd again showed some impact of “team work and team learning” ( $r = 0.214^{*}$ ,  $p = 0.56$ ,  $n = 56$ ), the only characteristic to do so for the two measurements of speed of organizational learning via new products introduced. There was also some

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significant impact of “free vertical and horizontal flow of information” ( $r = 0.264^{**}$ ,  $p = 0.025$ ,  $n = 56$ ) and “flexibility of company strategy and employees” ( $r = 0.238^{**}$ ,  $p = 0.041$ ,  $n = 54$ ).

Thirdly, the **extent of improvements in quality** was analysed by the items (e) “improvement of internal quality per units produced” and (f) “improvements of external quality per units produced”. The generation of these variables was explained at the beginning of this chapter. The null hypotheses were as follows.

**Null Hypothesis 1Be:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have a high improvement rate of internal quality of units produced.

Testing of **Null Hypothesis 1Be** revealed that “improvement of internal quality per units produced” was in one case weekly influenced by the variable “the Learning Organization’s characteristics”. This was the case for the period 1992 to 1994 ( $r = 0.291^*$ ,  $p = 0.066$ ,  $n = 28$ ), but neither for the period 1990 to 1992 ( $r = -0.183$ ,  $p = 0.227$ ,  $n = 19$ ) nor for the period 1990 to 1994 ( $r = 0.190$ ,  $p = 0.217$ ,  $n = 19$ ). The null hypothesis could therefore not be rejected as a whole.

**Null Hypothesis 1Bf:** Those car component suppliers in Britain who show higher scores in the characteristics of the Learning Organization do not have a higher improvement rate of external quality of units produced.

Correlation analysis showed that **Null Hypothesis 1Bf** could also not be rejected, as there was no significant effects of “the Learning Organization’s characteristics” on “improvements of external quality per units produced”. They were not significant for the period 1990 to 1992 ( $r = 0.238$ ,  $p = 0.187$ ,  $n = 16$ ), for the period 1992 to 1994 ( $r = 0.200$ ,  $p = 0.168$ ,  $n = 25$ ) and not significant for the period 1990 to 1994 ( $r = 0.277$ ,  $p = 0.141$ ,  $n = 17$ ).

The sub-null hypothesis of Null Hypothesis 1Be testing showed there were also direct effects of some of the Learning Organization’s characteristics, though only from three variables. The impact of “continuous improvement of work” was strongly significant in the period 1992 to 1994 ( $r = 0.489^{***}$ ,  $p = 0.004$ ,  $n = 29$ ) and significant for the

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period 1990 to 1994 ( $r = 0.404^{**}$ ,  $p = 0.038$ ,  $n = 20$ ), showing its importance once again with a direct impact. “Learning laboratories and constant experimentation” also had a significant impact in the period 1992 to 1994 ( $r = 0.322^{**}$ ,  $p = 0.044$ ,  $n = 29$ ) and weakly significant for the period 1990 to 1994 ( $r = 0.330^{*}$ ,  $p = 0.077$ ,  $n = 20$ ). And “free vertical and horizontal flow of information” was only weakly significant for the period 1992 to 1994 ( $r = 0.283^{*}$ ,  $p = 0.068$ ,  $n = 29$ ).

The sub-null hypothesis of Null Hypothesis 1Bf of the Learning Organization’s characteristics which could be rejected included again “continuous improvement of work”, which had a weakly significant impact for the period 1990 to 1992 ( $r = 0.335^{*}$ ,  $p = 0.087$ ,  $n = 18$ ) and significant for the period 1992 to 1994 ( $r = 0.347^{**}$ ,  $p = 0.038$ ,  $n = 27$ ) and significant for the period 1990 to 1994 ( $r = 0.437^{**}$ ,  $p = 0.031$ ,  $n = 19$ ). “Flexibility of company strategy and employees” showed significance for the period 1990 to 1992 ( $r = 0.444^{**}$ ,  $p = 0.037$ ,  $n = 17$ ), weak significance for the period 1992 to 1994 ( $r = 0.268^{*}$ ,  $p = 0.092$ ,  $n = 26$ ) and significance for the period 1990 to 1994 ( $r = 0.477^{**}$ ,  $p = 0.022$ ,  $n = 18$ ). Lastly, “free vertical and horizontal flow of information” only had a significant impact for the period of 1992 to 1994 ( $r = 0.345^{**}$ ,  $p = 0.039$ ,  $n = 27$ ).

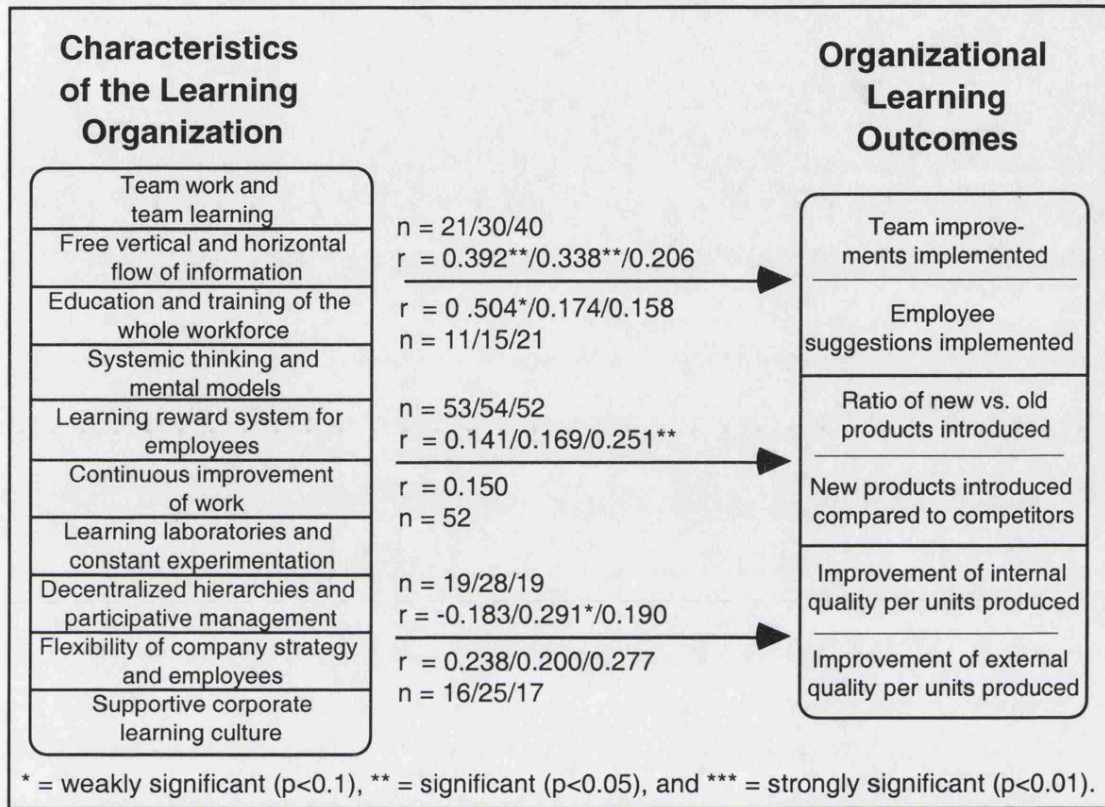
Comparing the impact of the characteristics on improvement of internal and external quality, “continuous improvement of work” is the only variable which plays a significant role in both cases, which shows its outstanding importance as a directly impacting variable. “Learning laboratories and constant experimentation” plays a major role for improvement of internal quality, whereas “flexibility of company strategy and employees” has a significant impact on the improvement of external quality. However, this is not enough to enable an overall direct impact of the characteristics, which enables a rejection of the null hypotheses. It must be kept in mind that the sometimes low level of valid cases must lead to a cautious approach when interpreting this data.

In summary, the correlation analysis of Hypothesis 1B showed virtually no significant correlation between the Learning Organization’s characteristics and organizational learning outcome (see Figure 8.7), which was not sufficient to enable a rejection of the whole Null Hypothesis 1 B.



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**Figure 8.7: Correlation and Impact of the Learning Organization's Characteristics on Organizational Learning Outcomes**



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

The first group, measuring the *amount of team and individual learning which turned into organizational learning*, showed a weakly significant impact on team improvements on average, but none on employee suggestions. The former appears to be the only direct impact of “the scale of the ten characteristics of the Learning Organization” on organizational learning outcomes, according to the correlation analysis of Hypothesis 1B.

The second group, dealing with the *speed of organizational learning*, i.e., speed of product development, showed virtually no significant impact from “the variable of the ten Learning Organization's characteristics”. A closer look at each of the ten characteristics revealed that a couple of the characteristics of the Learning Organization alone, in particular “team work and team learning” and “continuous improvement of work” had some significant impact. This means, whereas the former plays a major role in

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product development of complete new products, the latter is more helpful for improving old products.

The third group, the *extent of improvements in quality*, did not show much significant impact from the variable consisting of “the scale of the ten Learning Organization’s characteristics”. However, when looking closer at each of the ten characteristics, “continuous improvement of work” showed some form of significance in five of the six cases. This can be seen as an indicator for the paramount importance of this characteristic for this specific organizational learning outcome in the form of the improvement in quality.

However, some of these correlation coefficients were computed with a very small number of valid cases, which should be a caveat for their interpretation.

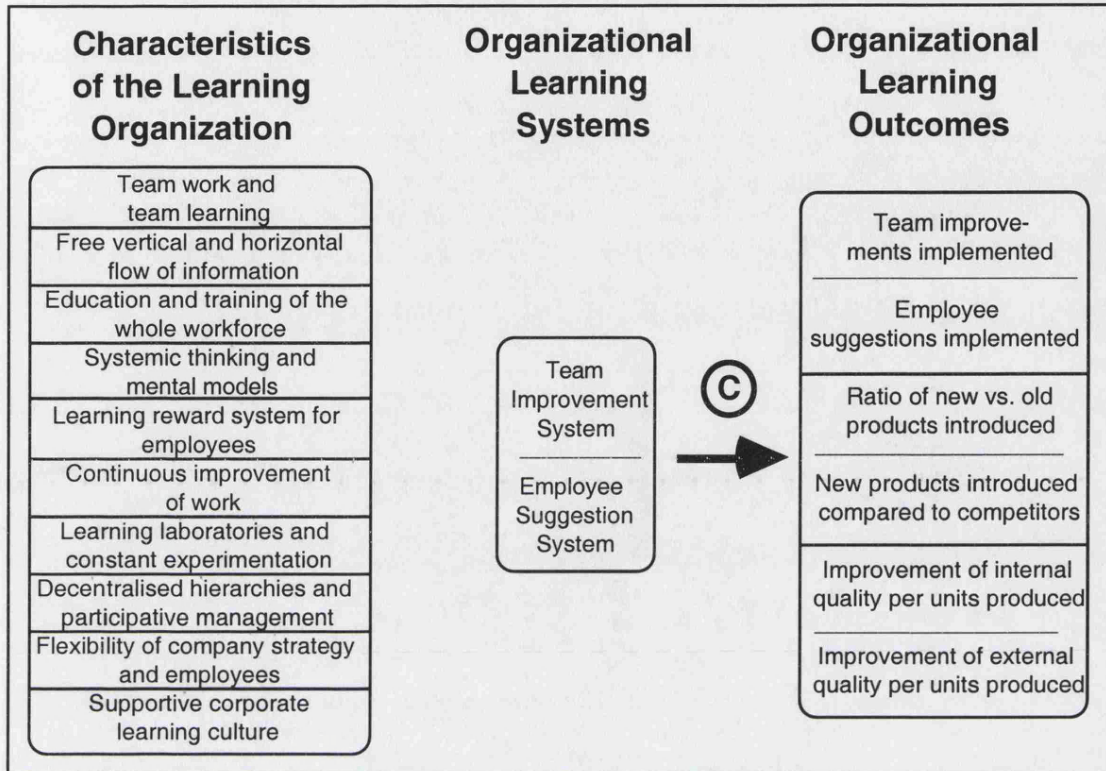
Having investigated the correlation analysis of Hypothesis 1B, the same method of analysis is applied to the testing of Hypothesis 1C.

### 8.2.4. Statistical Analysis of Hypothesis 1C

The third part of the statistical analysis of Hypothesis 1 is conducted by measuring the impact of “organizational learning systems” (independent variable) on “organizational learning outcomes” (dependent variables) (see Figure 8.8).



**Figure 8.8:** Hypothesised Impact of Organizational Learning Systems on Organizational Learning Outcomes



Correlation analysis of Hypothesis 1C, the last part of Hypothesis 1, was done for the assessment of the direct impact of organizational learning systems on organizational learning outcome. As has been introduced at the beginning of this chapter, Hypothesis 1C was as follows.

**Hypothesis 1C:** Those car component suppliers in Britain who employ organizational learning systems have better organizational learning outcomes.

Before Hypothesis 1C was tested it was transformed into a null hypothesis for empirical testing.

**Null Hypothesis 1C:** Those car component suppliers in Britain who employ organizational learning systems do not have better organizational learning outcomes.

*the null hypothesis is a claim*



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Firstly, an analysis was conducted with scales that measure the **amount of team and individual learning which turned into organizational learning**.

They were (a) “team improvements implemented per employee” and (b) “employee suggestions implemented per employee”. The null hypotheses were as follows.

**Null Hypothesis 1Ca:** Those car component suppliers in Britain who employ organizational learning systems do not have more team improvement projects implemented.

Correlation analysis showed that **Null Hypothesis 1Ca** could be rejected, as there was a significant impact of “organizational learning systems” on “team improvements implemented per employee”. Significance could be shown in 1990 with an  $r$  of 0.362\*\* ( $p = 0.045$ ,  $n = 23$ ), in 1992 with an  $r$  of 0.319\*\* ( $p = 0.035$ ,  $n = 33$ ) and in 1994 with an  $r$  of 0.221\* ( $p = 0.077$ ,  $n = 43$ ).

**Null Hypothesis 1Cb:** Those car component suppliers in Britain who employ organizational learning systems do not have more suggestions per employee implemented.

Testing of **Null Hypothesis 1Cb** indicated that it could be rejected, because the average significant impact of “organizational learning systems” on “employee suggestions implemented per employee” varied strongly, however, with low valid cases as a caveat. Whereas 1990 was significant with an  $r$  of 0.615\*\* ( $p = 0.017$ ,  $n = 12$ ) and 1992 was even strongly significant with an  $r$  of 0.644\*\*\* ( $p = 0.004$ ,  $n = 16$ ), but 1994 was not significant with an  $r$  of 0.197 ( $p = 0.189$ ,  $n = 22$ ).

The correlation analysis of the first group of organizational learning variables showed that there is a slight difference between the organizational learning systems, when comparing the outcome of team improvements per employee implemented to the outcome of suggestions per employee implemented. Both showed a significant impact on average, but the latter in conjunction with considerable lower numbers of valid cases.

In-depth analysis showed a similar picture regarding the significance. The performance of team improvements systems alone had a significant impact on team suggestions (same outcome as Null Hypothesis 1Ca testing above in 1990 ( $r = 0.362$ \*\*,  $p = 0.045$ ,  $n = 23$ ), in 1992 ( $r = 0.319$ \*,  $p =$

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0.035,  $n = 33$ ) and in 1994 ( $r = 0.221^*$ ,  $p = 0.077$ ,  $n = 43$ ). Whereas the impact on employee suggestions implemented was still significant in 1990 ( $r = 0.615^{**}$ ,  $p = 0.017$ ,  $n = 12$ ), it was only weakly significant in 1992 ( $r = 0.3851^*$ ,  $p = 0.070$ ,  $n = 16$ ) and not significant in 1994 ( $r = -0.1511$ ,  $p = 0.251$ ,  $n = 22$ ). The negative value of the correlation coefficient in 1994, although not significant, can be explained by the impressions gained from the in-depth interviews that companies with a continuous team improvement system tend to focus more on team improvements rather than employee suggestions, the latter are even abandoned sometimes.

Secondly, the speed of organizational learning was researched, which was measured by the scales (c) "ratio of new products introduced compared to existing products" and (d) "new products introduced compared to competitors".

**Null Hypothesis 1Cc:** Those car component suppliers in Britain who employ organizational learning systems do not have a higher ratio of new products introduced compared to existing products.

Correlation analysis of **Null Hypothesis 1Cc** revealed a significant impact of "organizational learning systems" on "ratio of new products introduced compared to existing products". This was not the case for a period of one year ( $r = 0.160$ ,  $p = 0.119$ ,  $n = 56$ ), but for two years ( $r = 0.219^{**}$ ,  $p = 0.049$ ,  $n = 58$ ) and four years ( $r = 0.229^{**}$ ,  $p = 0.046$ ,  $n = 55$ ). This meant that the null hypothesis as a whole could be rejected<sup>100</sup>.

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<sup>100</sup> The independent variable "team improvement system" (which could include suppliers with a "employee suggestion system" but did not need to) had an even stronger impact on the "ratio of new products introduced compared to existing products". It was significant for product introductions newer than one year ( $r = 0.246^{**}$ ,  $p = 0.034$ ,  $n = 56$ ), it was strongly significant for introductions newer than two years ( $r = 0.345^{***}$ ,  $p = 0.004$ ,  $n = 58$ ) and four years ( $r = 0.347^{***}$ ,  $p = 0.005$ ,  $n = 55$ ). This would mean a rejection of the hypothesis without any objection.

The independent variable "employee suggestion system" (which could include companies with a "team improvement system", but did not need to) did not show any significance at all (one year:  $r = -0.026$ ,  $p = 0.423$ ,  $n = 56$ , two years:  $r = -0.104$ ,  $p = 0.217$ ,  $n = 58$  or four years:  $r = -0.073$ ,  $p = 0.297$ ,  $n = 55$ ).

This comparison indicated that continuous team improvement systems were significantly conducive to the speed of the development process and output of new products (this was measured with the help of the

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Null Hypothesis 1Cd:** Those car component suppliers in Britain who employ organizational learning systems do not have a quicker product introduction compared to competitors.

The correlation analysis of **Null Hypothesis 1Cd** revealed no effects of “organizational learning systems” on “new products introduced compared to competitors”, as the correlation coefficient was not significant ( $r = -0.002$ ,  $p = 0.494$ ,  $n = 56$ )<sup>101</sup>.

There are many explanation for this poor impact. On the one hand, it could be that measurement of the company's own position was highly subjective, and comparing one's position to others also depends on the ability to monitor the market, which makes the judgement worse the better a company is in monitoring the competition. On the other hand, the nature of the new products introduced can vary from an improved version of an existing product (involving team improvement systems) to the completely new development of a product (involving project teams), the distinction of which could not be measured here. However, the characteristic “team work and team learning” of Null Hypothesis 1Bc1 and 1Bd1 showed the impact of project teams on new products introduced, which underlined the assumption that especially “new products introduced compared to competitors” applies more to the complete new development of a product rather than to an improved version of an existing product.

Thirdly, the **extent of improvements in quality** was analysed by the items (e) “improvement of internal quality per units produced” and (f) “improvements of external quality per units produced”. The generation of these variables was explained at the beginning of this chapter. The null hypotheses were as follows.

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ratio of new products compared to existing ones). Employee suggestion systems did not have any such impact on the speed of new products introduced. An explanation for this might be the fact that product development, mainly seen as a new improved version of the old product, is a complex process, where problems are easier to solve in teams.

<sup>101</sup> Neither the detailed analysis of a “team improvement system” ( $r = 0.073$ ,  $p = 0.296$ ,  $n = 56$ ) nor an “employee suggestion system” ( $r = -0.182$ ,  $p = 0.447$ ,  $n = 56$ ) alone revealed any significant impact.



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**Null Hypothesis 1Ce:** Those car component suppliers in Britain who employ organizational learning systems do not have a higher improvement rate of internal quality of units produced.

Testing of **Null Hypothesis 1Ce** revealed that “improvement of internal quality per units produced” was strongly influenced by “organizational learning systems”, therefore, the null hypothesis could be rejected. Even though this was not the case for the period 1990 to 1992 ( $r = 0.156$ ,  $p = 0.255$ ,  $n = 20$ ), but significance was strongly significant for the period 1992 to 1994 ( $r = 0.497^{***}$ ,  $p = 0.003$ ,  $n = 29$ ) and the period 1990 to 1994 ( $r = 0.644^{***}$ ,  $p = 0.001$ ,  $n = 20$ ).

However, this time the existence of a “team improvements system” had a highly significant impact on improvement of internal quality, though not for the period 1990 to 1992 ( $r = 0.156$ ,  $p = 0.255$ ,  $n = 20$ ), but strongly significant for the period 1992 to 1994 ( $r = 0.520^{***}$ ,  $p = 0.002$ ,  $n = 29$ ) and over the whole period 1990 to 1994 ( $r = 0.644^{***}$ ,  $p = 0.001$ ,  $n = 20$ ). But the impact of “employee suggestion system” alone was not significant for any of the periods.

**Null Hypothesis 1Cf:** Those car component suppliers in Britain who employ organizational learning systems do not have a high improvement rate of external quality of units produced.

Analysis of **Null Hypothesis 1Cf** showed that it could be rejected as there were significant effects on the dependent variable “improvements of external quality per units produced” by the independent variable “organizational learning systems”. They were significant for the period 1990 to 1992 ( $r = 0.486^{**}$ ,  $p = 0.020$ ,  $n = 18$ ), not significant for the period 1992 to 1994 ( $r = 0.134$ ,  $p = 0.252$ ,  $n = 27$ ), but again strongly significant for the period 1990 to 1994 ( $r = 0.659^{***}$ ,  $p = 0.001$ ,  $n = 19$ ).

In detail, the existence of a “team improvement system” had a highly significant impact on improvement of external quality for the period 1990 to 1992 ( $r = 0.615^{***}$ ,  $p = 0.003$ ,  $n = 18$ ), and weakly significant for the period 1992 to 1994 ( $r = 0.258^*$ ,  $p = 0.096$ ,  $n = 27$ ), but again strongly significant for the whole period 1990 to 1994 ( $r = 0.708^{***}$ ,  $p = 0.000$ ,  $n = 19$ ). The existence of an “employee suggestion system” showed a less strong impact: it was only significant for the period 1990 to 1992 ( $r = 0.422^*$ ,  $p = 0.040$ ,  $n = 18$ ) and for the whole period 1990 to 1994 ( $r = 0.355^*$ ,  $p = 0.068$ ,  $n = 19$ ).

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All in all, this group comprising the degree of improvements in quality showed at least a strongly significant impact for the period from 1990 to 1994. This shows that the organizational learning systems played a major role in the process of improving internal as well as external quality. However, the impact of the "team improvement system" was considerable stronger than that of the "employee suggestion system", which showed no significant impact on the improvement of internal quality at all. Besides the caveat of a high level of missing values, the reason for this is that team learning systems were not only more effective, but that the improvement of quality represents a complex task of organizational learning which can rarely be solved by individuals alone.

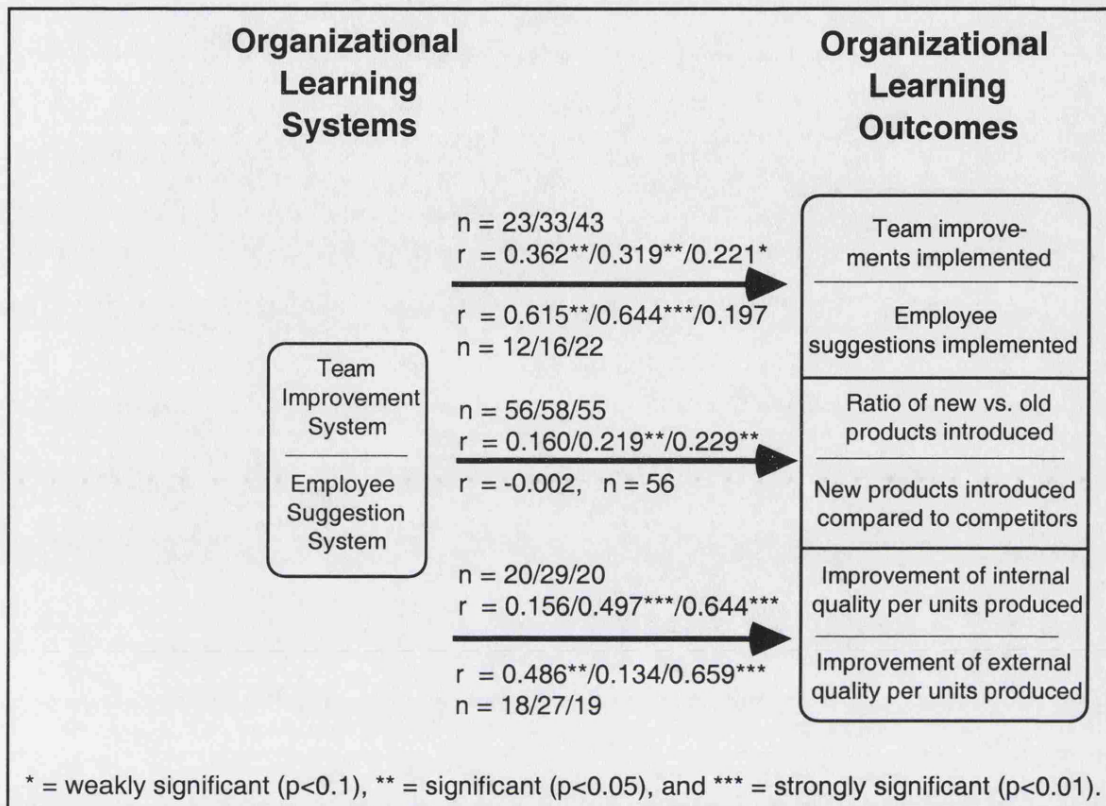
In summary, the correlation analysis of Hypothesis 1C showed that there was a predominantly significant impact of organizational learning systems on organizational learning outcomes (see Figure 8.9), which could be measured. Albeit sometimes low numbers of valid cases, the patterns and the interpretation are straightforward.

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**Figure 8.9:** Correlation and Impact of Organizational Learning Systems on Organizational Learning Outcomes



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

On average, the impact of “organizational learning systems” on “team improvements per employee implemented” and on “suggestions per employee implemented” was significant. There was a clearly significant impact on the ratio of new products introduced compared to existing products, but none on the new products introduced compared to competitors. Lastly, a significant impact could be shown on the improvement of internal quality as well as of external quality.

The next sub-section concludes the analysis of the second section of this chapter. It provides an overview of the analysis of Hypothesis 1.



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### 8.2.5. Results of the Analysis of the First Hypothesis

The second section of Chapter 8 analysed the first hypothesis: is there an influence of the Learning Organization's characteristics and/or organizational learning systems on organizational learning outcomes?

The data analysis, aided by the theoretical argument, showed that there was a **strongly significant direct impact** of "the Learning Organization's characteristics" on "organizational learning systems" (rejection of Null Hypothesis 1A), **but not** on "organizational learning outcomes" (no rejection of Null Hypothesis 1B).

However, as there is on average a **significant impact** of "organizational learning systems" on "organizational learning outcomes" (rejection of Null Hypothesis 1C), this leads to the conclusion of an **indirect impact** of "the Learning Organization's characteristics" on "organizational learning outcome" (see also highlighted symbols in Table 8.19).

Table 8.19: Summary of the Statistical Analysis of Hypothesis 1

Hypothesis 1: Impact	of LOCs	of LOCs	of OLSs
on OLSs	1 A	1 B	1 C
Organizational Learning Systems	***		
on OLOs			
a) Team Improvements impl.		*	**
b) Employee Suggestions impl.		-	**
c) New Product Share		-	**
d) New Product Introduction		-	-
e) Internal Quality Improvement		-	**
f) External Quality Improvement		-	**

LOCs = the Learning Organization's characteristics, OLSs = Organizational learning systems, OLOs = Organizational learning outcomes, - = no significance, \* = significant at 10%, \*\* = significant at 5%, \*\*\* = significant at 1% (all on average)

Correlation analysis of Null Hypothesis 1A showed a highly significant impact of the "scale of the ten Learning Organization's characteristics" on the dependent variable "organizational learning systems" ( $r = 0.383^{***}$ ,  $n$

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= 64). In detailed analysis the “scale of the ten Learning Organization’s characteristics” had a varying role: it had a strongly significant impact when applied to “team improvement systems” alone ( $r = 0.430^{***}$ ,  $n = 64$ ), but none when applied to “employee suggestion systems” alone ( $r = 0.046$ ,  $n = 64$ ). This suggested that the degree of the ten Learning Organization’s characteristics played a much more important role for the successful installation and running of the former compared to the latter.

Multiple logistic regression analysis of Hypothesis 1A showed that only the Learning Organization’s characteristic “systemic thinking and mental models” had a significant impact on the existence of an “organizational learning system”. This was in line with the theoretical discussion in Chapter 3, which argued that systemic thinking was the key characteristic for an organization to become and continue to be a Learning Organization.

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concluded  
clearly

Correlation analysis of Hypothesis 1B showed on average only one weakly significant correlation coefficient between “the Learning Organization’s characteristics” and the six constituents of “organizational learning outcomes”. Weakly significant correlation existed in particular with “team suggestions implemented” and “employee suggestions implemented”. This was not sufficient to reject the second part of Null Hypothesis 1.

This means that the degree of the “characteristics of the Learning Organization” tended to influence “organizational learning outcomes” indirectly via “organizational learning systems”, as testing of Hypothesis 1C revealed.

his  
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Correlation analysis of Hypothesis 1C showed that there was a predominantly significant impact of “organizational learning systems” on “organizational learning outcomes”. This enabled a rejection of this third part of the Null Hypothesis 1. On average, the impact on “team improvements per employee implemented” and on “suggestions per employee implemented” was significant. There was also a clearly significant impact on the “ratio of new products introduced compared to existing products”, but none on the “new products introduced compared to competitors”. Furthermore, on average, a significant impact could be shown for “improvement of internal quality” as well as “improvement of external quality”.



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Analysis of the second group of “organizational learning outcomes” clearly demonstrated that “team improvement systems” played a pivotal role for new product introduction measured by the “ratio of new products introduced compared to existing products”. There was no significant impact on the variable which measured “new products introduced compared to competitors”. It has been suggested that this was mainly because this variable applied more to a completely new development of a product (influenced by project teams) than to an improved version of a product.

Detailed analysis of the third group of “organizational learning outcomes” relating to quality improvement again emphasised the picture that “team improvement systems” were much more important (with a strongly significant impact) for the improvement of internal as well as external quality than “employee suggestion systems” (which on average was only weakly significant for the improvement of external quality). Besides the caveat of a high level of missing values, the reason for this is that “team learning systems” were not only more effective, but that the improvement of quality represents a complex task of organizational learning which can rarely be solved by “individual learning systems” on their own.

In summary, the interpretation of the outcome of the correlation and regression analysis of Hypothesis 1 was threefold.

Firstly, the research suggests that the degree to which “the Learning Organization’s characteristics” exists is **conducive** to the successful implementation and running of “organizational learning system(s)”. Moreover, “the ten Learning Organization’s characteristics” have a strongly significant impact on “team improvement systems” alone, but none on “employee suggestion systems” alone. This shows that the characteristics apparently play a much more important role for the successful implementation of “team improvement systems” compared to “employee suggestion systems”. This picture will be confirmed in the in-depth interviews in Chapter 9. *concl*

Secondly, there was **no significant direct impact** of “the Learning Organization’s characteristics” on the extent of “organizational learning outcomes” to be shown by hypothesis testing with this research. This lack



All seems to be logical: ie character  
system  
outcome

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

of direct impact does not necessarily mean that there is not any indirect impact.

Thirdly, the existence of “organizational learning systems” is **crucial** for an organization to generate “organizational learning outcomes”, as its impact was significant. This emphasises the indirect nature of “the Learning Organization’s characteristics”, via “organizational learning systems” as an intermediate variable, on “organizational learning outcomes”. A more detailed analysis of “organizational learning systems” revealed that, on average, “team improvements systems” generally had a more significant impact on “organizational learning outcomes” than “employee suggestion systems”, which had a weakly or non-significant impact.

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These relationships mentioned above are shown in Figure 8.10 below.

Additionally, there was some insight gained about the speed of organizational learning, which was measured with the help of (c) “ratio of new products introduced compared to existing products” and (d) “new products introduced compared to competitors”. This could vary from a complete new development of a product to just an improved version of an existing product.

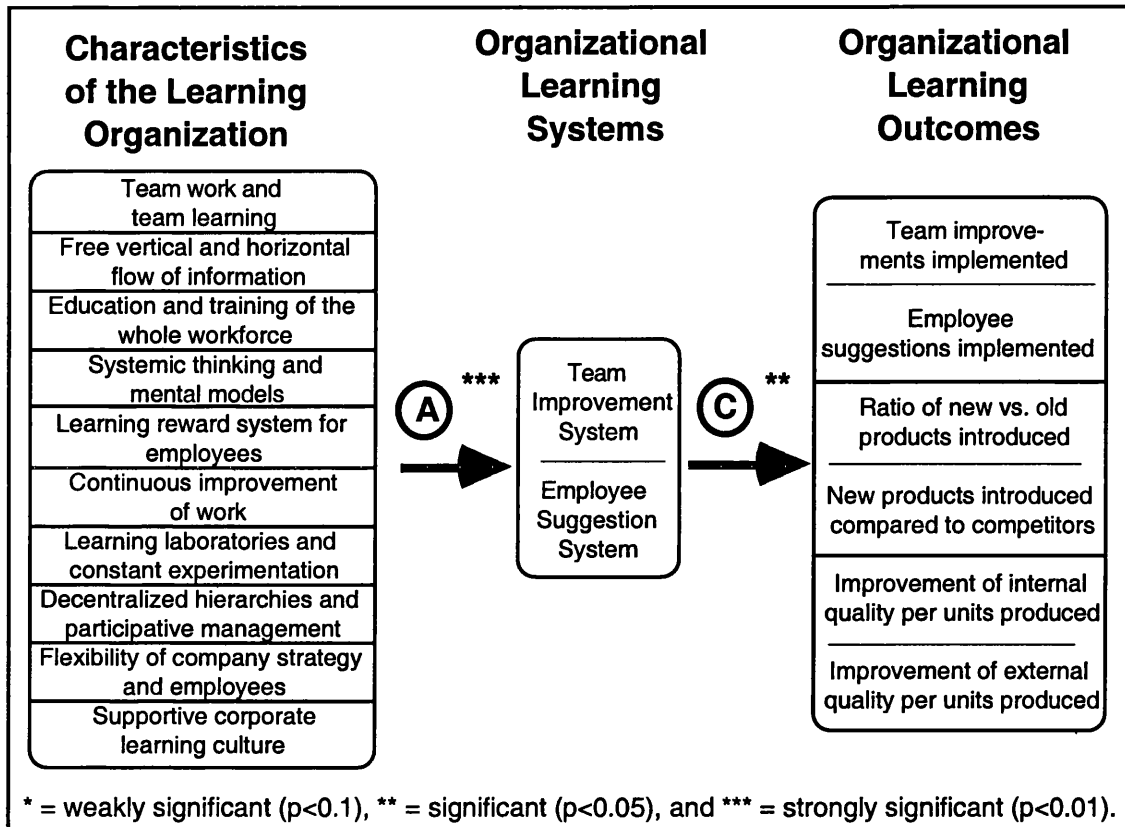
The characteristic “team work and team learning” (especially project teams with customers as well as suppliers, but also cross-departmental and hierarchical project teams) was the only one which had a significant impact on both variables, i.e. on “ratio of new products introduced compared to existing products” as well as “new products introduced compared to competitors”. Both of them might apply more to complete new product development with the help of development teams in reality.

“Organizational learning systems”, however, only had an impact on “the ratio of new products introduced” rather than on “new products introduced compared to competitors”. Therefore, the existence of “organizational learning systems” is more likely to have an impact on the improvement of existing products. This distinction could not be measured here, however, it makes sense in reality that “team improvements systems” and “employee suggestion systems” are predominantly used for product improvements, which could be confirmed by the interviews.

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## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Figure 8.10: Impact of the Learning Organization's Characteristics on Organizational Learning Systems and Outcomes**



This section of Chapter 8 showed, by testing Hypothesis 1, that the Learning Organization's characteristics, via organizational learning systems, have a positive indirect impact on organizational learning outcomes.

The next section looks at the question of where these Learning Organization's characteristics originated.



### 8.3. Analysis of the Second Hypothesis

The second hypothesis dealt with the sources of the characteristics of the Learning Organization. The assumption was made that Japanese car companies were these sources, as for example, Senge (1990), Adler & Cole (1993) and Garvin (1993) point out, there are some Japanese car producers that can be classified as Learning Organizations. The higher the score of the ten characteristics the closer an organization comes to being an ideal Learning Organization. Additionally, the underlying reasons why some companies learnt to acquire the Learning Organization's characteristics to a greater degree than others were explored. To offset the limitation of the cross-sectional nature of the questionnaire, a detailed analysis of the process of acquiring characteristics of the Learning Organization was undertaken with the help of in-depth interviews, presented in the succeeding Chapter 9.

The basic assumption was that for the acquisition of the characteristics of the Learning Organization a transfer of explicit and implicit knowledge was needed. Especially for the transfer of tacit knowledge personal contact within an official company relationship was required. This was measured through the existence and duration of different types of relationships<sup>102</sup>. These could be, for example, with Japanese car manufacturers as customers and Japanese suppliers as owners or as co-operators.<sup>103</sup>

The second hypothesis was developed to test the impact of relationships between Japanese car producers, or component suppliers, and car component suppliers in Britain on the successful implementation of the Learning Organization's characteristics.

The Hypothesis 2, developed in Chapter 6, was as follows.

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<sup>102</sup> A more detailed analysis of the extent of the relationship by measuring the man days of personnel exchange was not feasible, as there were too many incomplete or missing answers to these questions.

<sup>103</sup> Most companies did not complete this detailed section in the questionnaire relating to Japanese suppliers as customers, as suppliers or as co-members of supplier associations (which can include competitors). Therefore, these kind of source measurements were dropped in the analysis of this data set.



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**Hypothesis 2:** Those car component suppliers in Britain who have a relationship with Japanese companies have higher scores in the characteristics of the Learning Organization.

Hypothesis 2 tested whether the characteristics of the Learning Organization found at component suppliers was due to relationships with Japanese companies in the car industry (i.e. car producers and car component suppliers). It also assessed whether personal contact represented the important transmitter of tacit knowledge. The importance of personal contact in the form of “socialization” for transmitting tacit knowledge<sup>104</sup> is also mentioned by Nonaka (1994: 19) (see also Chapter 2.2.).

The sub-hypotheses of the second hypothesis were developed in the following order.

**Hypothesis 2A:** Those car component suppliers in Britain who have a relationship with Japanese car producers have higher scores in the characteristics of the Learning Organization.

**Hypothesis 2B:** Those car component suppliers in Britain who have a relationship with Japanese car component suppliers as owners have higher scores in the characteristics of the Learning Organization.

**Hypothesis 2C:** Those car component suppliers in Britain who have a relationship with Japanese car component suppliers as co-operating partners<sup>105</sup> have higher scores in the characteristics of the Learning Organization.

The research approach of Hypothesis 2 is depicted in Figure 8.11. The influence of Japanese car producers (independent variable) on characteristics of the Learning Organization (dependent variable) is indicated with an “A”. The impact of Japanese car component suppliers as owners (independent variable) on characteristics of the Learning Organization (dependent variable) is marked with a “B”. Lastly, the influence of Japanese car component suppliers as co-operating partners

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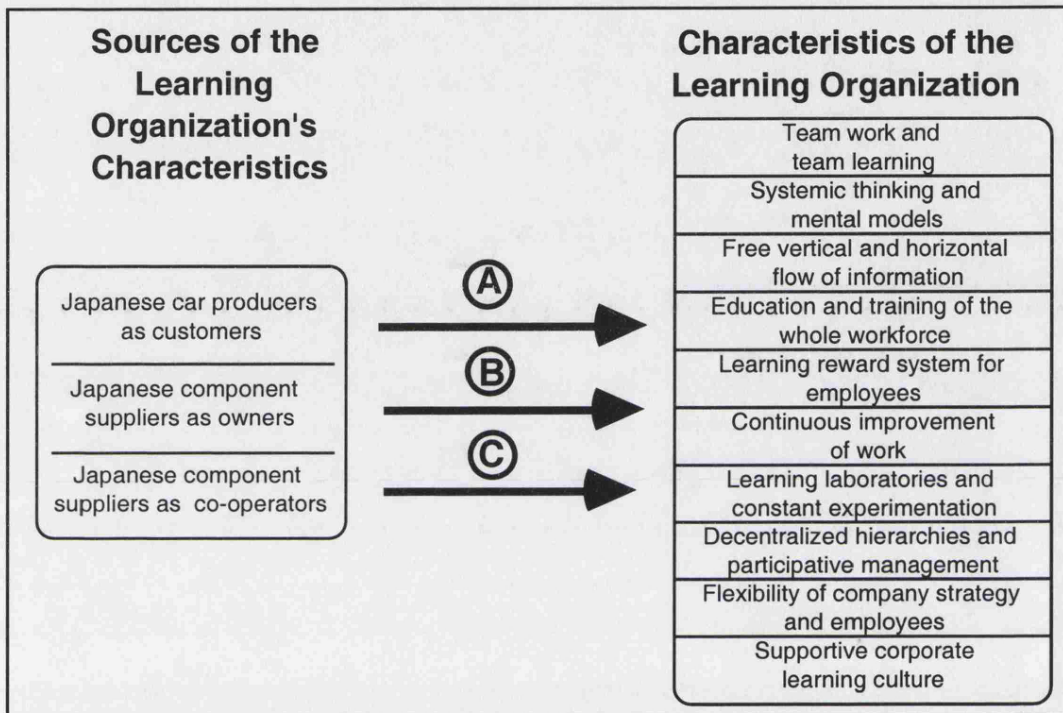
<sup>104</sup> For Nonaka (1994: 33) tacit knowledge can be associated with organizational culture and procedures whereas explicit knowledge has the form of documents, filing systems, computerised databases, etc.

<sup>105</sup> Co-operations could have the form of a joint-ventures, technical assistance/collaboration/agreements or design/technical co-operations to improve quality.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

(independent variable) on characteristics of the Learning Organization (dependent variable) is indicated with a “C”.

**Figure 8.11:** Assumed Impact of Japanese Companies on the Degree of Suppliers' Characteristics of the Learning Organization



This second hypothesis was analysed with the help of different items, of which the dependent variable (characteristics the Learning Organization) have been explained at the beginning of Chapter 8. The independent variables will be explained in the following sub-section.

### 8.3.1. Additional Items for Analysis of the Second Hypothesis

The second hypothesis analyses whether the acquisition of the ten characteristics of the Learning Organization was due to a relationship with Japanese car producers and/or car component suppliers. These direct sources of characteristics were measured and tested for significance in correlation and regression analysis, which in turn was interpreted as causation due to the theoretical argument of this thesis.



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Additionally, information about the year of the establishment of the relationship with the Japanese car producer and/or car component supplier was gathered. Moreover, the organizational resources devoted to change, as well as the receptivity of the company, were analysed with the help of the questionnaire data.

The questions relating to the Japanese car companies as customers (which were concluded from their name) looked as follows:

1. Car assemblers as your customers: What is their a) name, b) country of location, and c) in which year did the relationship begin?
  - 1) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 2) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 3) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 4) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 5) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_

The following questions were used for Japanese suppliers as owners (which were identified by their name and their country of origin):

8. Is your company partially or wholly owned by one or more companies?  
O No O Yes If yes, what is their a) name, b) country of origin, and c) entry year?
  - 1) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 2) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
  - 3) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_

And these were the questions for the Japanese suppliers as co-operating partner companies. Co-operations were in the form of joint-ventures, technical assistance/collaboration agreements or design/technical co-operations to improve quality.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

1. Do you co-operate with Japanese supplier(s) producing similar products?  
☐ No ☐ Yes If yes, what is a) their name, b) the form of co-operation, and c) in which year did the co-operation start?

- 1) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_  
 2) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_  
 3) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_

The descriptive statistics for the variables, which measured the relationship with Japanese companies in the car industry as origins of the Learning Organization's characteristics, are presented in Table 8.20 below.

**Table 8.20: Descriptive Statistics for the Sources Variables**

No	Variable	n
1	<b>All Japanese Companies as Car Prod. Customers</b> Mean: 0.58 St. Dev.: 0.49 Min.: 0.00 Max.: 1.00	31
2	<b>Nissan</b> Mean: 0.35 St. Dev.: 0.48 Min.: 0.00 Max.: 1.00	19
3	<b>Honda</b> Mean: 0.28 St. Dev.: 0.45 Min.: 0.00 Max.: 1.00	15
4	<b>Toyota</b> Mean: 0.17 St. Dev.: 0.37 Min.: 0.00 Max.: 1.00	9
5	<b>Japanese Suppliers as Owners</b> Mean: 0.10 St. Dev.: 0.30 Min.: 0.00 Max.: 1.00	5
6	<b>Japanese Suppliers as Co-operators</b> Mean: 0.19 St. Dev.: 0.40 Min.: 0.00 Max.: 1.00	10

Note: Variable No 1 is composed from Variable No 2, 3 and 4,  
 n = number of valid positive cases

The descriptive statistics consist of the mean, the median, the maximum, the minimum and the number of observations (n). The

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relationships were measured by whether they existed or not. The variable “all Japanese companies as car producing customers” was generated by whether there was a connection to at least one of the three companies Nissan, Honda or Toyota.<sup>106</sup>

The correlation matrix, which shows the inter-correlation between Japanese companies in the car industry as origins of the Learning Organization’s characteristics within the research sample, is shown in Table 8.21.

Table 8.21: Correlation Matrix of Japanese Companies as Sources of the Learning Organization’s Characteristics

Variable	1	2	3	4	5	6
1	1.000					
2	0.629	1.000				
3	0.529	0.054	1.000			
4	0.381	0.290	0.050	1.000		
5	0.232	0.098	- .097	- .033	1.000	
6	0.322	0.149	0.143	0.179	0.194	1.000

Note: For key of numbers (No) of the six variables see previous Table 8.20.

After introducing the new independent variables, the next section will look at the research approach of the hypothesis testing.

### 8.3.2. Research Approach for the Second Hypothesis

Null Hypothesis 2, which was derived from Hypothesis 2, looked as follows.

*style still*

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<sup>106</sup> The same variable, constructed by adding the number of Japanese car assemblers, e.g., supplying Nissan = 1, or Toyota and Honda = 2, showed similar results in the analysis, but was not used here.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Null Hypothesis 2:** Those car component suppliers in Britain who have a relationship with Japanese companies do not have higher scores in the characteristics of the Learning Organization.

The 3 sub-null hypotheses of Null Hypothesis 2 were tested with the help of correlation and multiple regression analysis. The “scale of the ten characteristics of the Learning Organization” was used as the dependent variable. It was constructed out of all ten characteristics from the questionnaire and, therefore, labelled “10C”, as explained in the beginning of this chapter. The significant relationships were interpreted as having an impact, following the argument of this thesis that the Learning Organization’s characteristics are transferred from Japanese car manufacturer or car suppliers to car component suppliers in Great Britain.

Hypothesis 2 was analysed empirically in detail, and the results of the analysis are presented below. The investigation starts with the examination of Hypothesis 2A.

### 8.3.3. Statistical Analysis of Hypothesis 2A

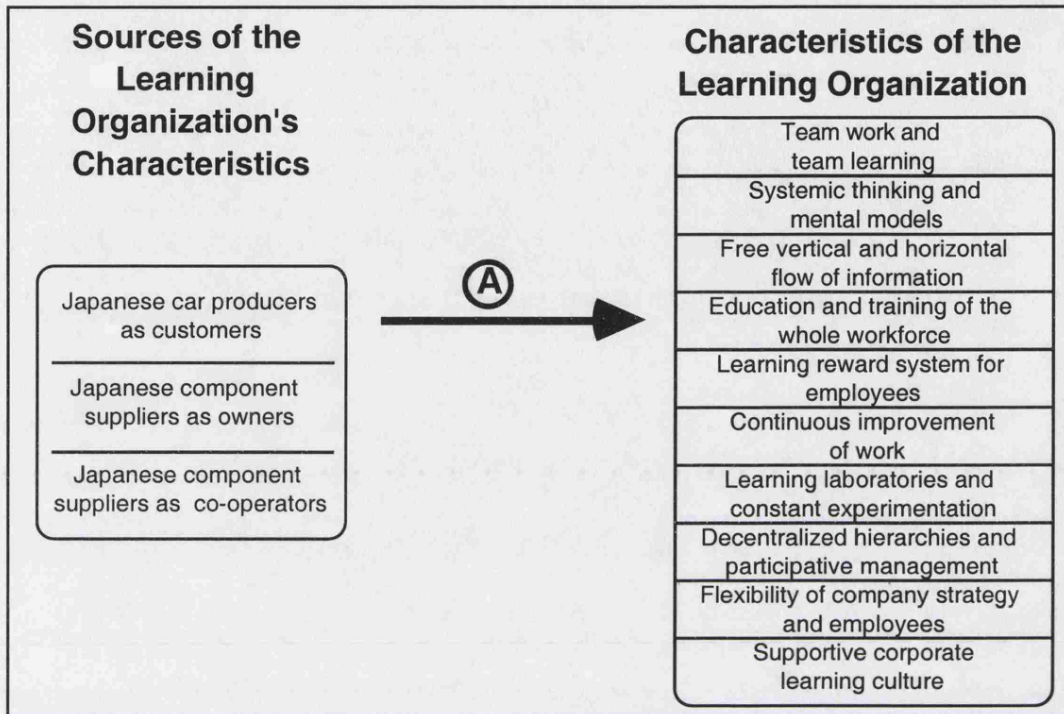
The analysis of Hypothesis 2A investigated the impact Japanese car companies had on the degree to which suppliers in Great Britain exhibit characteristics of the Learning Organization (see Figure 8.12).

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## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Figure 8.12:** Assumed Influence of Japanese Car Companies on Suppliers' Characteristics of the Learning Organization



Derived from Hypothesis 2A above, Null Hypothesis 2A was developed.

**Null Hypothesis 2A:** Those car component suppliers in Britain who have a relationship with Japanese car producers do not have higher scores in the characteristics of the Learning Organization.

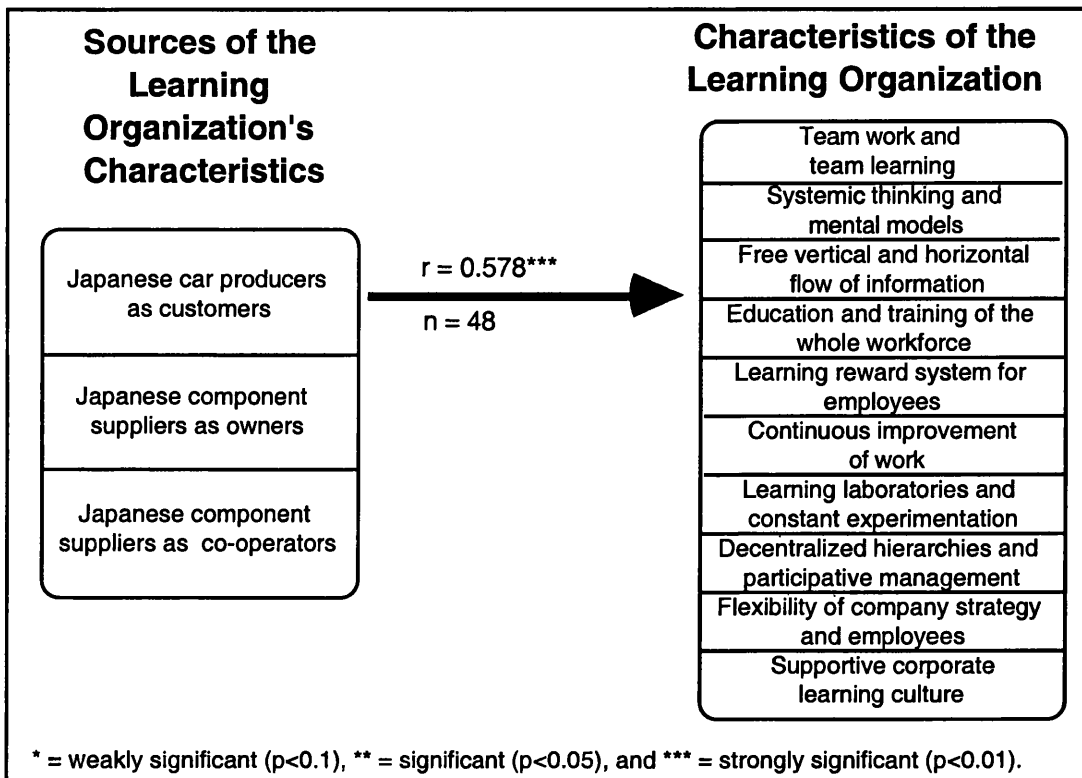
Correlation analysis of **Null Hypothesis 2A** showed that it could be rejected, because the relationship with Japanese car assembling customers had an impact on the degree to which car component suppliers in Great Britain showed the Learning Organization's characteristics.

The correlation coefficient  $r = 0.578^{***}$  ( $p < 0.001$ ,  $n = 48$ ) between the Japanese car assembling customers and the scale of the ten characteristics of the Learning Organization showed a strong significance, which was interpreted as an impact of the former on the latter. This outcome was regarded as being satisfactory for the empirical hypothesis testing, especially because of the strength of the significance level.

*quite  
but why?  
assume tho.*

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Figure 8.13: Influence of Japanese Car Companies as Customers on the Suppliers' Characteristics of the Learning Organization**



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

Looking closer at each of the ten characteristics, there was an obvious positive correlation between the existence of one or more Japanese car producing customers with the majority of the ten Learning Organization's characteristics.

This showed the impact of Japanese car producers on the car component suppliers' different characteristics of the Learning Organization. This impact was significant for all characteristics except "learning reward system." It was strongly significant for the characteristic "team work and team learning" ( $r = 0.458^{***}$ ,  $p < 0.001$ ,  $n = 53$ ), "continuous improvement of work" ( $r = 0.478^{***}$ ,  $p < 0.001$ ,  $n = 53$ ), "learning laboratories and constant experimentation" ( $r = 0.478^{***}$ ,  $p < 0.001$ ,  $n = 52$ ) and "flexibility of company strategy and employees" ( $r = 0.341^{***}$ ,  $p = 0.007$ ,  $n = 51$ ).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

The impact of Japanese car assembling customers was significant on “systemic thinking and mental models” ( $r = 0.282^{**}$ ,  $p = 0.021$ ,  $n = 52$ ), on “education and training of the whole workforce” ( $r = 0.270^{**}$ ,  $p = 0.026$ ,  $n = 52$ ), on “decentralized hierarchies and participative management” ( $r = 0.293^{**}$ ,  $p = 0.016$ ,  $n = 53$ ) and on “supportive corporate learning culture” ( $r = 0.319^{**}$ ,  $p = 0.011$ ,  $n = 51$ ), but only weakly significant on “free vertical and horizontal flow of information” ( $r = 0.207^*$ ,  $p = 0.068$ ,  $n = 53$ ).

There was no impact on “learning reward system for employees” ( $r = 0.071$ ,  $p = 0.306$ ,  $n = 53$ ), which might have been caused by the fact that the Japanese approach to learning reward systems was adapted to a more western style. These also included considerable amounts of direct monetary rewards (at least this was the case in some of the supplier companies interviewed), which is less common in Japan.

A summary of the correlation analysis results is compiled in Table 8.22.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.22: Impact of Relationship with Japanese Car Manufacturers  
Derived from Correlation Analysis**

LOCs	Variable	r	n
10C	Scale of the ten Learning Organization's charact.	0.413***	48
(1)	Team work and team learning	0.458***	53
(2)	Free vertical and horizontal flow of information	0.207*	53
(3)	Education and training of the whole workforce	0.270**	52
(4)	Systemic thinking and mental models	0.282**	52
(5)	Learning reward system for employees	0.071	53
(6)	Continuous improvement of work	0.478***	53
(7)	Learning laboratories and constant experimentation	0.326***	52
(8)	Decentralized hierarchies and particip. management	0.293**	53
(9)	Flexibility of company strategy and employees	0.344***	51
(10)	Supportive corporate learning culture	0.319**	51

\* = weakly significant (p<0.1), \*\* = significant (p<0.05) and \*\*\* = strongly significant (p<0.01).

LOCs = Learning Organization's characteristics, r = regression coefficient,  
n = number of valid cases

Besides the testing of Hypothesis 2A, there was no direct significant impact of Japanese car producers as customers on the combined variable “**organizational learning system**” ( $r = 0.121$ ,  $p = 0.194$ ,  $n = 53$ )<sup>107</sup>.

However, when looking at the constituent factors, it showed that there was a significant impact on the dependent variable “continuous improvement team system” alone ( $r = 0.278^{**}$ ,  $p = 0.022$ ,  $n = 53$ )<sup>108</sup>, whereas “employees suggestion system” ( $r = - 0.233^{**}$ ,  $p = 0.046$ ,  $n = 53$ )<sup>109</sup> also showed significance, but in the negative direction. This could be

<sup>107</sup> Split up, there was in fact a significant result for Nissan ( $r = 0.241^{**}$ ,  $p = 0.041$ ,  $n = 53$ ), but neither for Honda ( $r = - 0.083$ ,  $p = 0.275$ ,  $n = 53$ ) nor for Toyota ( $r = 0.146$ ,  $p = 0.148$ ,  $n = 53$ ).

<sup>108</sup> This time, Nissan ( $r = 0.360^{***}$ ,  $p = 0.004$ ,  $n = 53$ ) and Toyota ( $r = 0.218^{*}$ ,  $p = 0.058$ ,  $n = 53$ ) were significant, but not Honda ( $r = - 0.018$ ,  $p = 0.449$ ,  $n = 53$ ).

<sup>109</sup> Here none of the three Japanese car companies showed any significance at all: Nissan ( $r = - 0.126$ ,  $p = 0.183$ ,  $n = 53$ ), Honda ( $r = 0.017$ ,  $p = 0.451$ ,  $n = 53$ ) and Toyota ( $r = - 0.007$ ,  $p = 0.478$ ,  $n = 53$ ).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

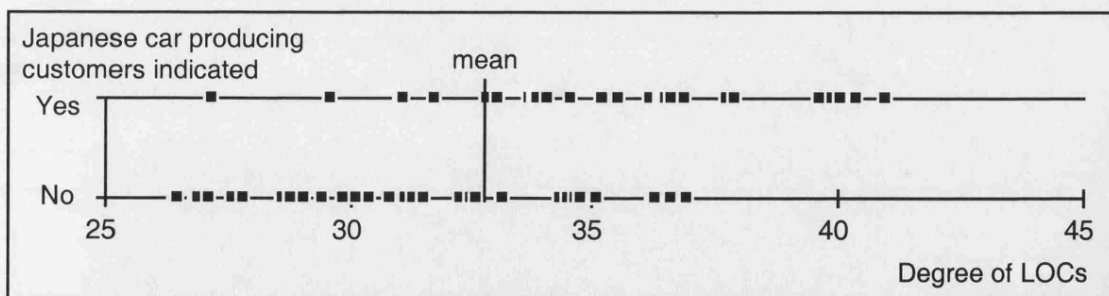
interpreted that Japanese car assembling customers had a positive impact on “team improvement systems”, but a negative impact on “employee improvement systems”.

The interviews showed that this was due to those component suppliers who had relationships with Japanese manufacturers normally abandoned their insufficiently working employee suggestion systems, when they installed a team improvement systems. The latter was the favoured system of Japanese car companies. However, there was an indication that these suppliers intended to re-introduce the employee suggestion system at a later stage.

Lastly, an overview is given on the positioning of the different car component suppliers with respect to their score on the scale of the ten Learning Organization’s characteristics. Also, their supply relationship with Japanese car assemblers is taken into account (see Figure 8.14).

The mean established on the scale of the Learning Organization’s characteristics is 33. There is a clear indication that the majority of the suppliers without a relationship with Japanese car producing customers are below the mean, whereas the majority of the component suppliers with a relationship with Japanese car producing customers are above the mean.

**Figure 8.14:** Car Component Suppliers’ Position According to Degree of LOCs and Relationship with Japanese Car Assemblers



LOCs = the Learning Organization’s characteristics

In order to obtain a deeper insight into the data set, the independent variables were split up into the **three different Japanese car assemblers** situated in Britain, which were Nissan, Honda and Toyota.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

The data showed the significant difference in the influence exerted by the various Japanese car assemblers on the Learning Organization's characteristics of car component suppliers in Britain (see Table 8.23).

**Null Hypothesis 2A (Nissan):** Those car component suppliers in Britain who have a relationship with Nissan do not have higher scores in the characteristics of the Learning Organization.

This Null Hypothesis 2A (Nissan) could be rejected, as there was a strongly significant impact on the "scale of the ten Learning Organization's characteristics" ( $r = 0.470^{***}$ ,  $p < 0.001$ ,  $n = 48$ ). In detail, Nissan had a varying significant impact on six of the suppliers' characteristics.

**Null Hypothesis 2A (Honda):** Those car component suppliers in Britain who have a relationship with Honda do not have higher scores in the characteristics of the Learning Organization.

This Null Hypothesis 2A (Honda) could not be rejected, because the correlation coefficient with the "scale of ten characteristics" ( $r = 0.029$ ,  $p = 0.421$ ,  $n = 48$ ) was not significant. None of the characteristics of the companies supplying Honda showed any positive significant impact from Honda.

**Null Hypothesis 2A (Toyota):** Those car component suppliers in Britain who have a relationship with Toyota do not have higher scores in the characteristics of the Learning Organization.

This Null Hypothesis 2A (Toyota) could be rejected as there was a highly significant correlation coefficient with the "scale of the ten Learning Organization's characteristics" of the car component suppliers ( $r = 0.508^{***}$ ,  $p < 0.001$ ,  $n = 48$ ). Toyota had a varying significant impact on seven of the ten Learning Organization's characteristics.

So it is clear  
that probably  
right: Honda  
couldn't choose  
good suppliers  
or had fewer  
supplier base



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.23: Impact of Relationship with Japanese Car Manufacturers  
derived from Correlation Analysis in Detail**

<b>LOCs</b>	<b>Nissan (r)</b>	<b>Honda (r)</b>	<b>Toyota (r)</b>	<b>n</b>
10 C	0.479***	0.029	0.508***	48
(1)	0.390***	0.049	0.354***	53
(2)	0.000	- .064	0.162	53
(3)	0.144	- .034	0.153	52
(4)	0.098	- .056	0.253**	52
(5)	0.259**	- .106	0.329***	53
(6)	0.298**	0.014	0.434***	53
(7)	0.333***	0.013	0.332***	52
(8)	0.141	0.019	0.377***	53
(9)	0.212*	0.172	0.189*	51
(10)	0.274**	0.096	0.237**	51

\* = weakly significant (p<0.1), \*\* = significant (p<0.05), and \*\*\* = strongly significant (p<0.01).

LOCs = the Learning Organization's characteristics, r = correlation coefficient

For key of characteristics of the Learning Organization see Table 8.22 above

When combining all three Japanese car companies in a multiple regression analysis, Null Hypothesis 2A could be rejected, as the regression coefficient was highly significant (adj  $R^2 = 0.323^{***}$ ,  $n = 48$ ). This implied that about 32% of the observed variability in "the Learning Organization's characteristics" could be explained by the relationship of the component suppliers to Japanese car companies. Nissan ( $bc = 0.345^{***}$ ) and Toyota ( $bc = 0.400^{***}$ ) showed a strong significance, whereas this was not the case for Honda ( $bc = - 0.011$ ).

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**Table 8.24: Multiple Regression Analysis of Null Hypothesis 2A**

Variable	Standard Error	Beta Coeff.	Significance Level
Nissan	1.099	0.345***	0.009
Honda	1.126	- .011	0.926
Toyota	1.349	0.400***	0.002
Constant	0.695		0.000
adj R <sup>2</sup> = 0.323, n = 48			

There were various possible explanations for why Honda had no significant impact on the degree of the Learning Organization's characteristics of its suppliers. Some of the insight resulted from the in-depth interviews that were conducted after the data analysis. Possible interpretations were as follows.

Firstly, the data set may not have been representative. The data set could not be tested for its customers as there was no information publicly available about the population of customers of direct suppliers in Britain.

A second possible explanation could be that Honda only recently started its own customer relationships in Great Britain, because it used to co-operate with Rover in the past, before the split in 1994. However, the interviews conducted gave no indication of this explanation, and it rather was the case that Rover relied on help from Honda to nurture its suppliers.

Thirdly, Honda apparently adopted a policy which did not put too much pressure on their supplier to change. In the in-depth interviews one supplier admitted that Honda wanted them to change, but did not push too hard, because the company was reluctant to do so, as it felt it did not have sufficient resources for implementing the change at that point of time.

Fourthly, some suppliers could have been producing goods of an insignificant value for Honda. As a consequence, it did not make economic sense in terms of pay back for Honda to invest in training in order to teach these suppliers the characteristics of the Learning Organization. In fact,

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

this was the case with one of the suppliers, who was visited for in-depth interviews.

Last, but not least, it might be that Honda was not entirely the kind of Learning Organization the literature claims it was. Honda might possess the Learning Organization's characteristics, but did not have the ability to teach its suppliers how to become a Learning Organization in their own right. This is no contradiction of the fact that Honda sends "improvement employees" to fix suppliers' problems.

Analysis of the literature and history of the three Japanese car producers (Honda, Nissan and Toyota) supports this last explanation. The latter two were founded in the 1930s and started an intensive relationship with suppliers in Japan from the beginning with the target of developing them to an appropriate quality standard (which included supplier associations, called "kyoryokukai", according to Sako (1995 and 1996)). Honda, however, started with car production as late as the mid 1960s and could build on a lot of suppliers to Toyota and Nissan. According to Sako (1995: 10), "Honda could buy in parts from suppliers nurtured by other assemblers". Therefore, historically, Honda did not have to develop and improve a majority of its suppliers when it started, and Honda still does not have its own supplier association in Japan today (cf. Sako 1995: 1). In other words, Honda never had to learn to teach the characteristics of the Learning Organization to its suppliers in Japan. This difference in experience in Japan explains some of the difference in significance of impact between Toyota, Nissan and Honda in developing their supplier base in the UK.

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The interviews suggested that Honda in Britain employed a strategy to teach its suppliers by initiating co-operation between them and Honda's suppliers in Japan. MacDuffie & Helper (1996: 6) make a similar observation for Honda in the US. This indicates that Honda's supplier relation strategy outside Japan is different from the one within Japan. This does not deny the fact that Honda sent employees to its suppliers to improve their performance. For example, Mair (1994: 141) observes the following difference in North America: "Whereas in the conventional Western industrial model, assemblers and parts makers treat each other's factories as private, at Honda, related firms learn as much as they can about relevant parts of operations at their partners. Parts-maker engineers and production



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workers alike visit Honda to learn about the downstream processes in which 'their part' is used. More importantly, Honda and its transplant parts makers directly intervene in the 'internal' activities of their upstream parts makers." And MacDuffie & Helper (1996: 51) also suggest that Honda was more involved in fixing problems at the supplier sites than in teaching. Palmeri (1992: 52f) observes a similar picture, still he also reports on some training which Honda provides to employees of an American component supplier. Although there might be variances in the behaviour of Honda US and Honda UK, the overall experience from the US underlines the explanation of the data pattern in the UK.

Other **non-Japanese car producers** such as, for example, Rover ( $n = 41$ ) showed no significant correlation at all ( $r = 0.072$ ,  $p = 0.311$ ,  $n = 48$ ). Rover's pattern was similar to that of Honda, which is an indication of the long, close relationship both companies have had in the UK. Due to commonly-developed models, they also shared component suppliers in Britain (Honda started to produce its own cars in Great Britain in 1989).

A relationship with Ford ( $n = 27$ ) or Jaguar ( $n = 12$ ) neither showed any significant correlation with, i.e. impact on, the variable of the ten Learning Organization's characteristics. The analysis resulted in an  $r$  of 0.101 ( $p = 0.247$ ,  $n = 48$ ) and an  $r$  of 0.046 ( $p = 0.377$ ,  $n = 48$ ), respectively.

Only VW/Audi ( $n = 7$ ) had some significance with a positive impact ( $r = 0.216^*$ ,  $p = 0.070$ ,  $n = 48$ ) as a non-Japanese firm. This might come from a purchasing style, which had some Japanese elements (e.g., training of suppliers by purchasing teams).

General Motors ( $n = 17$ , including Vauxhall and Opel) had a negative significant impact on the ten Learning Organization's characteristics with an  $r$  of  $-0.239^*$  ( $p = 0.051$ ,  $n = 48$ ), which was similar to Mercedes Benz ( $r = -0.220^*$ ,  $p = 0.066$ ,  $n = 48$ ), which was, however, not strongly represented with only three valid cases.

The lack of valid cases was also true for the rest of the major car manufacturers, which did not show any significance. For instance, following other relationships were indicated: three with BMW ( $r = 0.028$ ,  $p = 0.424$ ,  $n = 48$ ), three with Renault ( $r = 0.024$ ,  $p = 0.434$ ,  $n = 48$ ), three

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

with Peugeot ( $r = -0.026$ ,  $p = 0.430$ ,  $n = 48$ ), four with Volvo ( $r = 0.132$ ,  $p = 0.185$ ,  $n = 48$ ) and two with Fiat ( $r = 0.172$ ,  $p = 0.121$ ,  $n = 48$ ).

All in all, except for VW/Audi, the major non-Japanese car producing customers showed no significant positive correlation coefficients compared to their Japanese counterparts.

This background makes the outcome of correlation analysis of Hypothesis 2A, that Japanese companies have an impact on the Learning Organization's characteristics of their suppliers in Great Britain, even more convincing.

A caveat here might be the method of data analysis, i.e. the correlation analysis relied on the theoretical impact models. The limitation of the size of the questionnaire did not allow more questions for firmer data analysis, which might have been able to test the causation in more depth. But this problem was partially offset by the exploratory and in-depth interviews, which backed the results established in the correlation analysis.

The research of Hypothesis 2A was extended, by also looking at the **duration of the relationship**, and whether this had any effect on the transfer of the Learning Organization's characteristics from Japanese car companies to component suppliers in Britain.

The sub-null hypothesis would, therefore, state that the length of the relationship between component suppliers and Japanese car manufacturers had no effect on the scoring in the characteristics of the Learning Organization.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.25: Descriptive Statistics for the Duration of the Relationships**

No	Variable	n
1	<b>All Japanese Companies as Car Prod. Customers</b> Mean: 8.08 St. Dev.: 12.71 Min.: 1 Max.: 10	23
2	<b>Nissan</b> Mean: 6.86 St. Dev.: 2.69 Min.: 1 Max.: 10	15
3	<b>Honda</b> Mean: 2.81 St. Dev.: 1.40 Min.: 1 Max.: 5	11
4	<b>Toyota</b> Mean: 3.14 St. Dev.: 0.69 Min.: 2 Max.: 4	7

Note: Variable No 1 is composed from Variable No 2, 3 and 4,  
Duration = 1995 - starting year of relationship, n = number of valid cases

Correlation analysis revealed that the sub-null hypothesis could be rejected with strong significance ( $r = 0.522^{***}$ ,  $p = 0.009$ ,  $n = 20$ ). This means, the longer the relationship lasted, the higher the scoring was Learning Organization's characteristics.

Taking a closer look at the three different Japanese manufacturers, Nissan's correlation coefficient showed a positive significance ( $r = 0.489^{**}$ ,  $p = 0.045$ ,  $n = 13$ ). However, neither Honda's ( $r = -0.461$ ,  $p = 0.106$ ,  $n = 9$ ) nor Toyota's ( $r = -0.343$ ,  $p = 0.226$ ,  $n = 7$ ) showed a significant positive correlation.<sup>110</sup>

The reason for no significant correlation in Toyota's case could have been, besides the low number of valid cases, the fact that Nissan's relationships started earlier (1985-94) and lasted over a longer period (up to 10 years). In comparison, Toyota's relationships started later (1991-93) and were also of a much shorter duration, with a maximum period of only 4 years (Honda (1990-94) had a maximum of 5 years).

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<sup>110</sup> A multiple regression analysis with the duration of the relationship to the three Japanese car assemblers, or in combination with the existence of the relationship as a controlling variable, could not be processed by the statistical computer program SPSS.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.26: Impact of Duration of Relationships on the Degree of Suppliers' Characteristics of the Learning Organization**

Company	r	p	n	years
All Japanese Car Companies	0.522***	0.009	20	1985-94
Nissan	0.489**	0.045	13	1985-94
Honda	- .461	0.106	9	1990-94
Toyota	- .343	0.226	7	1991-93

r = correlation coefficient, p = significance level, n = number of valid cases

In summary, correlation analysis rejected Null Hypothesis 2A, that there was no impact of Japanese car assemblers on the degree to which the characteristics of the Learning Organization could be found with component suppliers in Great Britain. This strongly significant rejection ( $r = 0.578^{***}$ ,  $n = 48$ ) was underlined by the fact that no significant positive correlation coefficient could be shown for the major non-Japanese car producers.

An additional finding after more detailed analysis revealed that, although Null Hypothesis 2A could be rejected for Nissan and Toyota (although Toyota only started in 1991 compared to Nissan's start in 1985), this was not the case for Honda. Besides various other factors, this could be best explained by its late entry into the automotive industry in Japan in the 1960s, when Honda could rely on suppliers for Nissan and Toyota, which had been nurtured and taught then since the 1930s. Therefore, Honda did not need to teach the characteristics of the Learning Organization to its suppliers in Japan, and Honda even nowadays is the only Japanese car manufacturer with no supplier association in Japan. *repeated from earlier*

However, this does not mean that Honda does not support its suppliers in Britain by sending employees when there are severe problems. The interviews suggested that, in Britain, Honda employed a strategy to teach its suppliers by initiating co-operations between them and Honda's suppliers in Japan.

The analysis of the relationship's length also confirms the general picture: the longer the duration of the relationship with Japanese car

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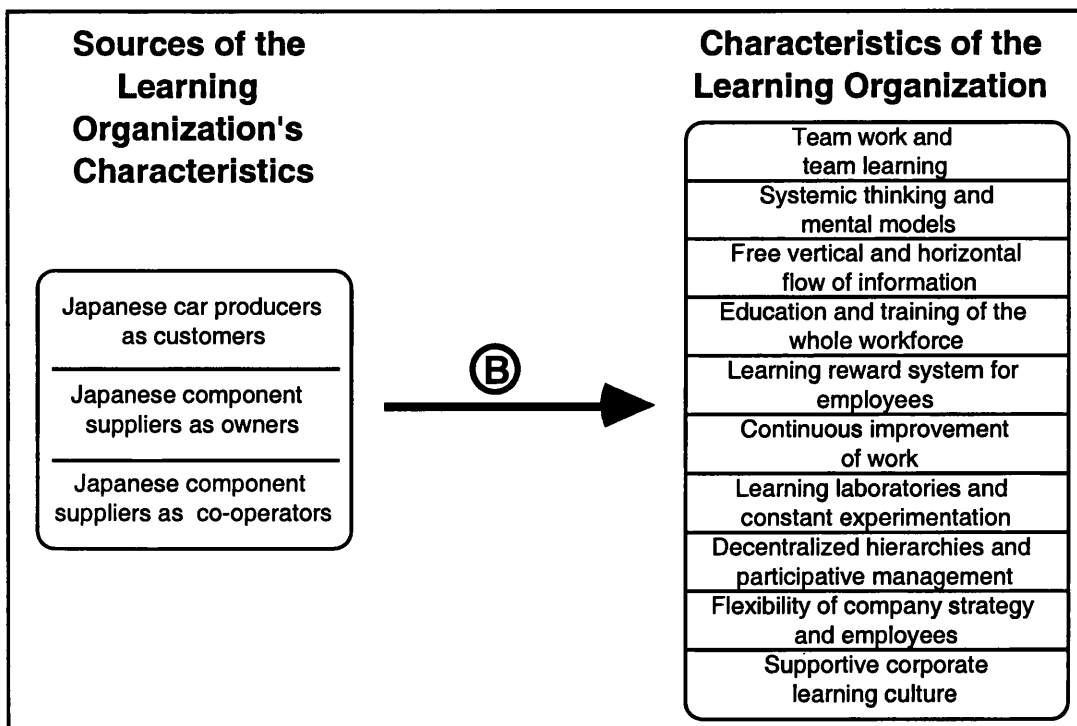
producers, the more the Learning Organization's characteristics could be found at component suppliers in Britain.

### 8.3.4. Statistical Analysis of Hypothesis 2B

The statistical analysis of Hypothesis 2B investigates the impact of Japanese component suppliers as owners on the degree to which the characteristics of the Learning Organization can be found at component suppliers in Great Britain (see Figure 8.15). The Null Hypothesis 2B went as follows.

**Null Hypothesis 2B:** Those car component suppliers in Britain who have a relationship with Japanese car component suppliers as owners do not have higher scores in the characteristics of the Learning Organization.

**Figure 8.15:** Assumed Impact of Japanese Suppliers as Owners on the Suppliers' Characteristics of the Learning Organization



Correlation analysis of Null Hypothesis 2B revealed that it could be rejected. The correlation coefficient was weakly significant for the "scale



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of the ten Learning Organization's characteristics" ( $r = 0.215^*$ ,  $p = 0.073$ ,  $n = 48$ ). Therefore, component suppliers in Britain which had a relationship with Japanese car component suppliers as owners ( $n = 5$ ) tended to have more distinct characteristics of the Learning Organization than those who did not have such a relationship. However, this impact was much weaker than Japanese car producers as customers.

The only Learning Organization's characteristic which had a strongly significant correlation coefficient was "free vertical and horizontal flow of information", which was an  $r$  of  $0.419^{***}$  ( $p = 0.001$ ,  $n = 49$ ).

The other two characteristics, which showed that Japanese suppliers as owners had a weakly significant impact on car component suppliers, were "systemic thinking and mental models" ( $r = 0.230^*$ ,  $p = 0.055$ ,  $n = 49$ ) and "continuous improvement of work" ( $r = 0.199^*$ ,  $p = 0.085$ ,  $n = 49$ ).

The rest of the characteristics did not show any significant correlation coefficients.

Additional findings, which emphasised that Null Hypothesis 2B could be rejected, showed that there were neither any positive significant correlations coefficients with parent companies from other nationalities.

British parent companies ( $n = 29$ ) had no significant impact on the scale of the ten Learning Organization's characteristics ( $r = -0.056$ ,  $p = 0.354$ ,  $n = 47$ ). As a consequence, UK parent companies could not generally be regarded as a source of the characteristics of the Learning Organization.

This lack of significant impact also applied to parent companies from other nationalities. American parent companies ( $n = 10$ ) also had no positive significant impact ( $r = 0.147$ ,  $p = 0.161$ ,  $n = 47$ ), neither did German parent companies ( $n = 5$ ) of suppliers in Britain ( $r = -0.140$ ,  $p = 0.173$ ,  $n = 47$ ). With the remaining companies, the number of companies from one country was too low to produced reliable results. These were parent companies with the following origins: one from Switzerland ( $r = -0.104$ ,  $p = 0.242$ ,  $n = 47$ ), two from France ( $r = -0.106$ ,  $p = 0.237$ ,  $n = 47$ ), one from Canada ( $r = -0.300^{**}$ ,  $p = 0.020$ ,  $n = 47$ ) and one from Italy ( $r = 0.228^*$ ,  $p = 0.061$ ,  $n = 47$ ).

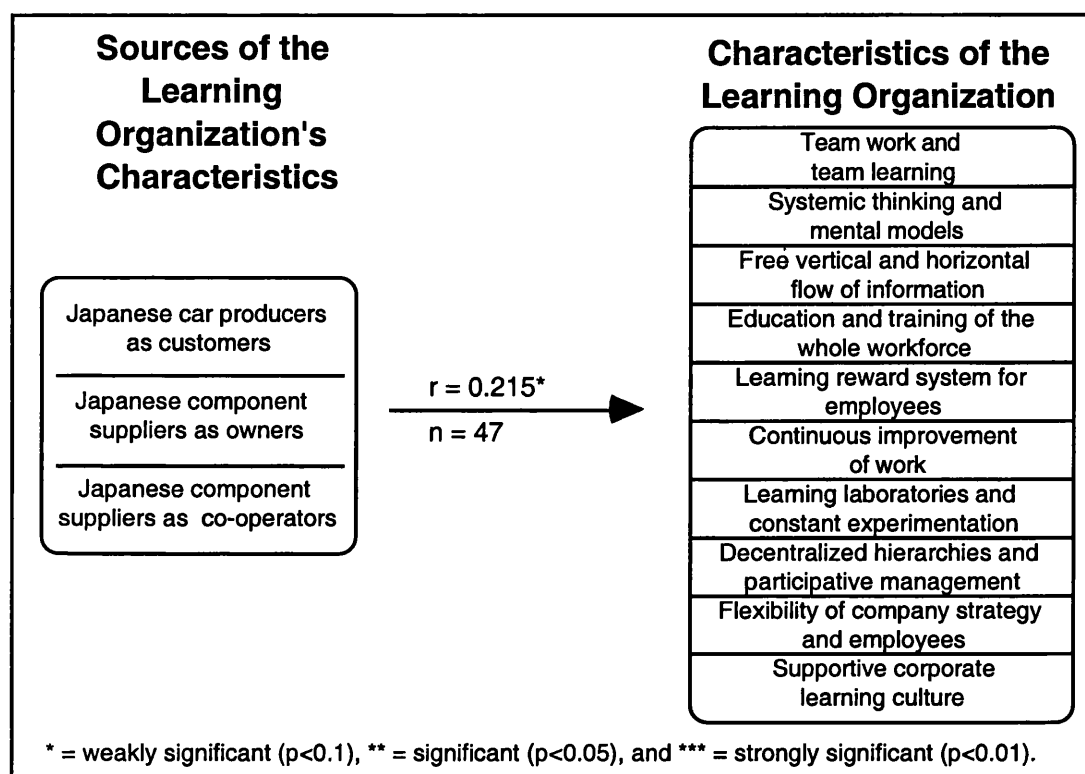
The picture was similar to Hypothesis 2A above: ownership by non-Japanese companies had no significant positive impact on the characteristics



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

of component suppliers in Britain. This again makes the impact of Japanese owners look even more relevant.

**Figure 8.16: Impact of Japanese Suppliers as Owners on the Suppliers' Characteristics of the Learning Organization**



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

In summary, correlation analysis of Null Hypothesis 2B demonstrated that it could be rejected, though not with the same vigour as Null Hypothesis 2A. This was because correlation was only weakly significant between the independent variable "Japanese suppliers as owners" and the dependent variable "scale of the ten Learning Organization's characteristics" of component suppliers in Britain. This weakly significant correlation was interpreted as a weakly positive impact of the former on the latter. The research result was emphasised by the fact that there were no positive significant correlations with parent companies from other nationalities.

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Three possible explanations for the only weakly significant results have been identified. Firstly, it might be that this knowledge, especially in a tacit form, is harder to transfer via a supplier as an owner, as this does not necessarily imply regular meetings and exchange of personnel on different hierarchical levels. Secondly, there might have been greater reluctance in a take-over to exert power, as the risk of failure tends to be very high with take-overs. Lastly, the transfer of the Learning Organization's characteristics from a Japanese supplier is only an indirect transfer of knowledge, originating from Japanese car producers.

*why is not all the power followed through?*

The next sub-section deals with the analysis of Hypothesis 2C, which investigated the impact of Japanese component suppliers as co-operators.

### 8.3.5. Statistical Analysis of Hypothesis 2C

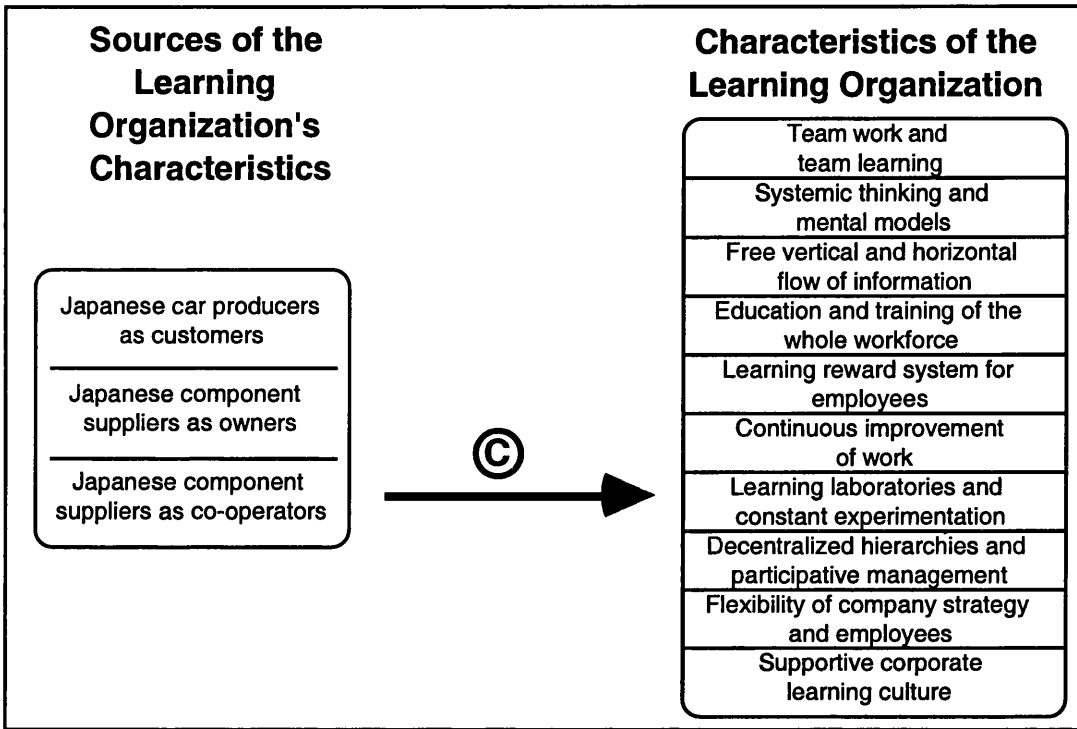
Analysis of Hypothesis 2C, as the third and last part of Hypothesis 2, studied the impact of Japanese car suppliers as co-operators on the suppliers' characteristics of the Learning Organization in Great Britain (see Figure 8.17). The corresponding Null Hypothesis 2C was as follows.

**Null Hypothesis 2C:** Those car component suppliers in Britain who have a relationship with Japanese car component suppliers as co-operating partners do not have higher scores in the characteristics of the Learning Organization.

*note how little research there is - each of the 20th cent studies!*

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Figure 8.17: Assumed Influence of Japanese Co-operators on the Suppliers' Characteristics of the Learning Organization**



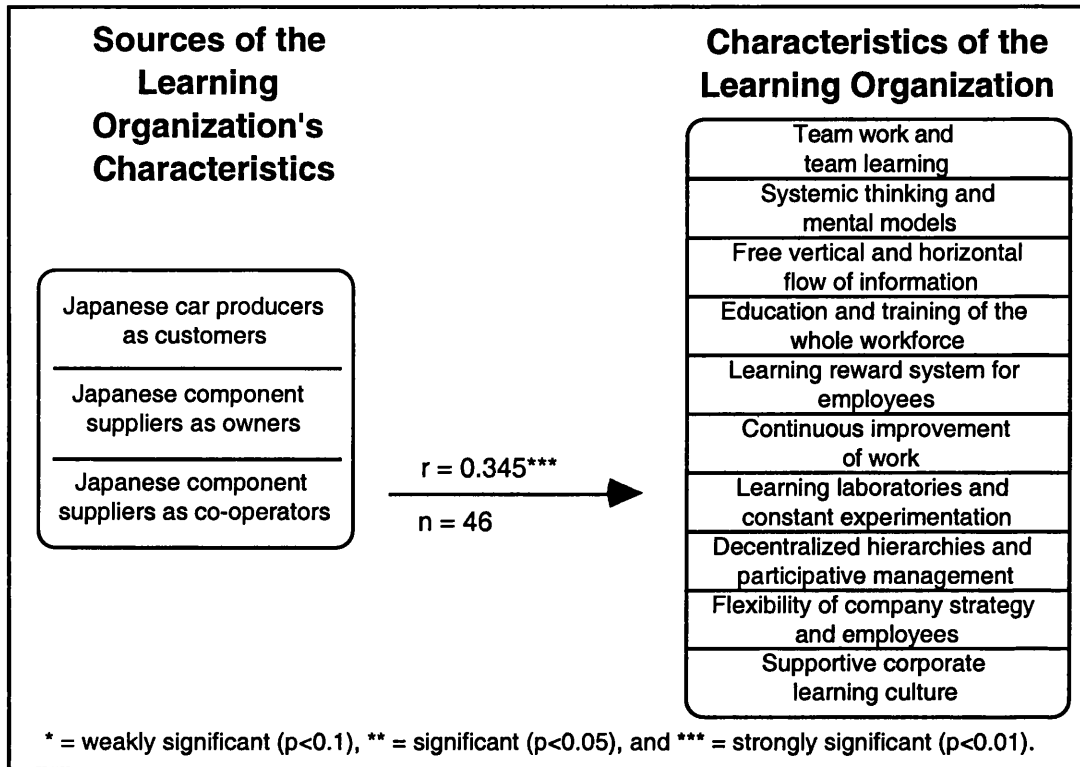
**Null Hypothesis 2C** could also be rejected, because there was a strongly significant correlation coefficient, interpreted as impact of “Japanese car component suppliers as co-operating partners” on the degree of the “characteristics of the Learning Organization” shown by car component suppliers in Britain ( $r = 0.345^{***}$ ,  $p = 0.009$ ,  $n = 46$ ).

Those characteristics of the Learning Organization that had significant positive correlation coefficients on their own were “team work and team learning” ( $r = 0.386^{***}$ ,  $p = 0.003$ ,  $n = 58$ ), “learning laboratories and constant experimentation” ( $r = 0.299^{**}$ ,  $p = 0.017$ ,  $n = 50$ ) and “flexibility of company strategy and employees” ( $r = 0.202^*$ ,  $p = 0.082$ ,  $n = 49$ ).



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**Figure 8.18: Influence of Japanese Suppliers as Co-operators on the Suppliers' Characteristics of the Learning Organization**



$n$  = number of valid cases,  $r$  = correlation coefficient,  $p$  = significance level

In summary, correlation analysis of Null Hypothesis 2C showed that it could be rejected with a strongly significant correlation coefficient. The interpretation was that the relationship with Japanese car component suppliers as co-operators tended to have a strongly significant positive impact on the degree to which the suppliers showed characteristics of the Learning Organization in Britain. This impact was slightly less strong as the impact created by Japanese customers, but much stronger than that created by Japanese parent companies.

After having tested the three sub-hypotheses of Hypothesis 2 on their own, the next section tests them in a multiple regression analysis.

### 8.3.6. Combined Regression Analysis of Hypothesis 2A&B&C

As a last step of the regression analysis of Hypothesis 2, a combined multiple regression analysis of the Null Hypothesis 2A, 2B and 2C was

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

performed. This included the three different Japanese company sources in one investigation, which cannot be done with correlation analysis.

**Null Hypothesis 2A&B&C:** Those car component suppliers in Britain who have a relationship with Japanese car producers and/or to Japanese car component suppliers as owners and/or to Japanese car component suppliers as co-operating partners do not have higher scores in the characteristics of the Learning Organization.

Multiple regression analysis of Null Hypothesis 2A&B&C, including the variable for all three Japanese car producers (i.e. Nissan, Toyota and Honda) revealed that there was a strongly significant regression of the three different Japanese types of sources on “the Learning Organization’s characteristics” (adj  $R^2 = 0.465$ ,  $n = 31$ ). It can be interpreted that nearly 47% of the observed variability in the “Learning Organization’s characteristics” could be explained by the relationship of car component suppliers in Britain with Japanese companies in the car industry, i.e. Japanese car producers and car components suppliers (see Table 8.27).

**Table 8.27:** Multiple Regression Analysis of Null Hypothesis 2A&B&C  
(Including Japanese Car Producers)

Variable	Standard Error	Beta Coeff.	Significance Level
Japanese car producers	1.433	0.638***	0.001
Japanese co-operators	1.367	0.233	0.102
Japanese owners	1.857	- .019	0.886
Constant	1.194		0.000
adj $R^2 = 0.465$ , $n = 31$			

A highly significant regression coefficient was shown by the “Japanese car producers” ( $bc = 0.638^{***}$ ,  $p = 0.001$ ). The “co-operating Japanese suppliers” were the next closest to a weak significance, but actually showed no significance ( $bc = 0.233$ ,  $p = 0.102$ ). “Japanese component suppliers as owners” showed no significant regression coefficient ( $bc = - 0.019$ ,  $p =$

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

0.886) and were far from being significant. This outcome is in line with the argument of this thesis that the original source of the Learning Organization's characteristics were Japanese car companies, whereas Japanese suppliers were only an indirect source.

A further multiple regression analysis of Null Hypothesis 2A&B&C, this time including the variables for Nissan, Honda and Toyota each, and not in a combined form as Japanese car customers, increased the 46.5% of the observed variability in "Learning Organization's characteristics" slightly to 48% which could be explained by the relationship of car component suppliers in Britain with Japanese companies in the car industry ( $\text{adj } R^2 = 0.480$ ,  $n = 31$ ) (see Table 8.28).

This time there were significant regression coefficients for Toyota ( $bc = 0.485^{***}$ ) and Nissan ( $bc = 0.363^{**}$ ). The co-operating Japanese suppliers registered a weak significance ( $bc = 0.260^*$ ). These results could confirm the picture gained by the correlation analysis before.

**Table 8.28:** Multiple Regression Analysis of Null Hypothesis 2A&B&C  
(Including Nissan, Honda and Toyota)

<b>Variable</b>	<b>Standard Error</b>	<b>Beta Coeff.</b>	<b>Significance Level</b>
Nissan	1.206	0.363**	0.011
Honda	1.312	- .026	0.845
Toyota	1.381	0.485***	0.001
Japanese owners	1.797	0.118	0.385
Japanese co-operators	1.342	0.260*	0.065
Constant	1.017		0.000
adj $R^2 = 0.480$ , $n = 31$			

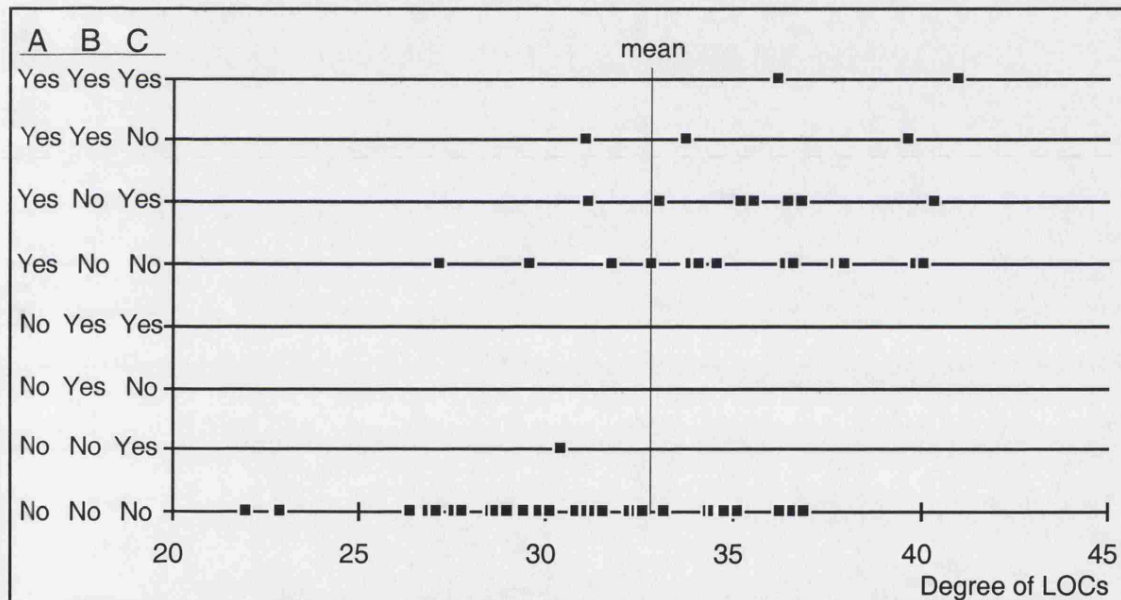
Finally, the positions of the different car component suppliers are presented, according to their degree of the scale of the Learning Organization's characteristics and whether they have a relationship with (A) Japanese car assemblers, (B) Japanese suppliers as owners and/or (C) Japanese suppliers as co-operators (see Figure 8.19).



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The mean, i.e. average, of the “scale of the Learning Organization’s characteristics” is nearly 33. The majority of the suppliers without a relationship with Japanese companies in the car industry are below the mean. The second line from the bottom in Figure 8.19 are the suppliers with relationships with Japanese suppliers as co-operators only. There are no companies that had relationships with Japanese suppliers as owners alone, or together with Japanese suppliers as co-operators. The majority of the component suppliers with a relationship with Japanese car producing customers are well above the mean.

**Figure 8.19:** Car Component Suppliers’ Position According to Degree of LOCs and Relationship with Japanese Companies



LOCs = the Learning Organization’s characteristics; A = Japanese car producing customers, B = Japanese suppliers as owners or C = Japanese suppliers as co-operating partners indicated

In summary, the multiple regression analysis of Hypothesis 2A&B&C shows a highly significant impact of “Japanese car companies” on “the Learning Organization’s characteristics” found at component suppliers (bc = 0.638\*\*\*, n = 31). It showed that 46.5% (or even 48%) of the observed variability in “the Learning Organization’s characteristics” of the

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

component suppliers in Britain could be explained by their relationship with Japanese companies.

It again demonstrated the dominance of Japanese car assemblers as the important source of the Learning Organization's characteristics. This was especially the case if compared to Japanese suppliers as parent companies, which did not show any significant impact, but also as a co-operating company, which showed a weak significance at best.

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The succeeding sub-section analyses some internal elements of the suppliers that might be conducive or impeding for the acquisition of the characteristics of the Learning Organization.

### 8.3.7. Analysis of Resources and Receptivity

The conducive and impeding factors for double-loop learning, i.e. resources for implementing change and receptivity to change, were also investigated. This was done in addition to evaluating Japanese companies in the car industry as sources for the Learning Organization's characteristics.

The statements in the questionnaire, to capture the six items measuring "resources" and "receptivity", were as follows.

XI.3. Do these statements describe your company's resources available for change? Choice: 1 (not at all) - 2 - 3 (partially) - 4 - 5 (very much)

- "Change programmes are not restricted by our resources."
- "We have employees who implement change programmes."
- "We employ consultants to facilitate change programmes."
- "We are receptive to new developments at the
  - a) top management level."
  - b) middle management level."
  - c) employee level."

Descriptive statistics for resources for implementing change as well as receptivity for change are shown in Table 8.29. These are the mean (i.e. the average), the standard deviation, the maximum, the minimum and the number of observations (n).

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## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.29: Descriptive Statistics for the Selected Variables of Resources for Change and Receptivity to Change**

<b>No</b>	<b>Variable</b>	<b>n</b>
1	<b>No change restrictions by resources</b> Mean: 3.10 St. Dev.: 1.10 Min.: 1.00 Max.: 5.00	70
2	<b>Employees as change facilitators</b> Mean: 3.38 St. Dev.: 1.04 Min.: 1.00 Max.: 5.00	70
3	<b>Consultants as change facilitators</b> Mean: 2.28 St. Dev.: 1.14 Min.: 1.00 Max.: 5.00	70
4	<b>Receptivity to new developments of top management</b> Mean: 4.20 St. Dev.: 0.92 Min.: 1.00 Max.: 5.00	70
5	<b>Receptivity to new developm. of middle management</b> Mean: 3.90 St. Dev.: 0.95 Min.: 2.00 Max.: 5.00	70
6	<b>Receptivity to new developments of employees</b> Mean: 3.62 St. Dev.: 0.95 Min.: 2.00 Max.: 5.00	70

n = number of valid cases

The inter-correlations between the six items measuring resources of change and receptivity to change are shown as a correlation matrix in Table 8.30.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.30: Correlation Matrix of Resources and Receptivity**

Variable	1	2	3	4	5	6
1	1.000					
2	0.180	1.000				
3	- .179	- .094	1.000			
4	- .019	0.219	0.109	1.000		
5	0.092	0.318	- .053	0.813	1.000	
6	0.160	0.249	- .234	0.398	0.584	1.000

Note: For key of numbers (No) of variables see previous table.

**Resources for implementing change** were measured by three items in the questionnaire.

The first item “Change programmes are not restricted by our resources.” showed a correlation coefficient which was not significant for the “scale of the ten Learning Organization’s characteristics” ( $r = 0.090$ ,  $p = 0.239$ ,  $n = 64$ ).

The second item “We have employees who implement change programs.” showed a strongly significant correlation coefficient for the “scale of the ten Learning Organization’s characteristics” ( $r = 0.359^{***}$ ,  $p = 0.002$ ,  $n = 64$ ). This indicated that there was an impact on the degree of the Learning Organization’s characteristics of component suppliers in Britain.

The third item “We employ consultants to facilitate change programmes.” correlated negatively with the “scale of the ten Learning Organization’s characteristics” ( $r = - 0.105$ ,  $p = 0.204$ ,  $n = 64$ ). Thus, it could not be shown that consultants have a positive impact on the degree of the Learning Organization’s characteristics.

In summary, only one of the three items measuring resources for implementing change had a significant impact. This was internal employees involved in change programmes which, as a sort of essential catalyst for change, helped the supplier companies acquire the characteristics of the Learning Organization.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Receptivity of management and employees to change** was also measured by three items.

The first item "We are receptive to new developments at the top management level." had a correlation coefficients which was highly significant on the "scale of the ten Learning Organization's characteristics" ( $r = 0.537^{***}$ ,  $p < 0.000$ ,  $n = 64$ ). This indicated that the top management of the suppliers had a significant impact on the existence of the Learning Organization's characteristics in their companies.

The second item "We are receptive to new developments at the middle management level." showed a strongly significant correlation with the "scale of the ten Learning Organization's characteristics" ( $r = 0.517^{***}$ ,  $p < 0.000$ ,  $n = 64$ ). This indicated that there was an impact on the middle management's receptivity on the degree of the Learning Organization's characteristics with component suppliers in Britain.

The third item "We are receptive to new developments at the employee level." again correlated strongly with the "scale of the ten Learning Organization's characteristics" ( $r = 0.425^{***}$ ,  $p < 0.000$ ,  $n = 64$ ). The value of the correlation coefficients of employee's receptivity, however, was lower than top and middle management's, respectively.

In summary, there were some strongly significant correlations between the three items measuring receptivity of management and employees and the scale of the ten characteristics of the Learning Organization, interpreted as impact of the former on the latter. This could be evidence that those companies with a higher receptivity at top and middle management level, as well as on employee level, had higher values in the Learning Organization's characteristics. This would confirm the view in the majority of the literature on organizational learning and Learning Organizations, which stresses the importance of the receptivity of all members within the Learning Organization. Still, the key role of the top management is clearly shown in the multiple regression analysis next.

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A multiple regression analysis of the six items of resources for and receptivity to change with the "scale of the ten Learning Organization's characteristics" indicated a significant beta coefficient (bc) in two cases. Of

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

the two significant items, “We are receptive to new developments at top management level.” had a significant bc of 0.404\*\*, which showed the importance of top management, and “We have employees who implement change programs.” had a weakly significant bc of 0.204\*. The adjusted R squared was 0.32% with 64 valid cases (adj R<sup>2</sup> = 0.319, n = 64).

**Table 8.31:** Multiple Regression Analysis of Resources for Change and Receptivity to Change on the Characteristics

<b>Variable</b>	<b>Standard Error</b>	<b>Beta Coeff.</b>	<b>Significance Level</b>
No resource restrictions	0.448	0.014	0.893
Internal facilitator	0.516	0.204*	0.070
External facilitator	0.442	- .072	0.510
Receptivity of top mm	0.922	0.404**	0.026
Receptivity of middle mm	1.015	0.003	0.986
Receptivity of employees	0.645	0.194	0.149
Constant	3.211		0.000
adj R <sup>2</sup> = 0.319, n = 64			

mm = management

Lastly, a multiple regression analysis of “Japanese companies” as sources, combined with “resources of and receptivity to change” with the “scale of the ten Learning Organization’s characteristics” was conducted (see Table 8.32.). It indicated the importance of two variables, however, with a clear lead of the Japanese car companies, indicated by a strongly significant beta coefficient for “Japanese car companies” as a source (bc = 0.585\*\*\*, p = 0.002), compared to a weakly significant “top management’s receptivity” (bc = 0.519\*) with a p of 0.052.

An adjusted R squared of 0.519 (n = 31) indicated that 52% of the variation of the “scale of the ten Learning Organization’s characteristics” could be explained by the combination of Japanese car companies and suppliers as well as the resources and receptivity of car component suppliers.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.32: Multiple Regression Analysis of Japanese Companies, Resources and Receptivity on the Characteristics**

<b>Variable</b>	<b>Standard Error</b>	<b>Beta Coeff.</b>	<b>Significance Level</b>
Japanese car company	1.665	0.585***	0.002
Japanese owner	1.886	- .027	0.846
Japanese co-operator	1.373	0.183	0.200
Restricted resources	0.588	- .107	0.427
Internal facilitator	0.678	- .068	0.647
External facilitator	0.619	- .183	0.200
Receptivity of top mm	1.324	0.519*	0.052
Receptivity of middle mm	1.268	- .246	0.319
Receptivity of employees	1.057	- .003	0.986
Constant	4.648		0.000
adj R <sup>2</sup> = 0.519, n = 31			

mm = management

The next and last sub-section of this chapter will give an overview of the results of the different forms of analysis of the second hypothesis.

### 8.3.8. Results of the Analysis of the Second Hypothesis

The third section of Chapter 8 analysed the second hypothesis, which is whether there is an influence of “Japanese car assembling or component supplying companies” on “the Learning Organization’s characteristics” of car component suppliers in Britain.

The theory-led data analysis, as summarized in Table 8.33 below, suggested that there was a strongly significant impact of “Japanese car companies as customers” on “the Learning Organization’s characteristics” of car component suppliers (Hypothesis 2A) and of “Japanese car component suppliers as co-operators” (Hypothesis 2C).

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

**Table 8.33: Summary of the Statistical Analysis of Hypothesis 2**

<b>Hypothesis:</b>	<b>2 A</b>	<b>2 B</b>	<b>2 C</b>	<b>2A&amp;B&amp;C</b>
<b>Impact on LOCs by</b>				
Japanese Car Producers as Customers	***			***
Japanese Suppliers as Owners		*		-
Japanese Suppliers as Co-operators			***	-

LOCs = the Learning Organization's characteristics, - = no significance,

\* = significant at 10%, \*\* = significant at 5%, \*\*\* = significant at 1%

The impact of "Japanese car component suppliers as owners" was only weakly significant in the correlation analysis (Hypothesis 2B). But it was not significant in the multiple regression analysis (Hypothesis 2A&B&C). One of the reasons for this difference was the fact that only the correlation analysis could be done one-tailed, i.e. analysing relationships more sensitively, which was not possible with regression analysis. The multiple regression analysis also means that the effect of "Japanese car companies as customers" on "the Learning Organization's characteristics" of car component suppliers was the strongest by far.

Correlation analysis rejected Null Hypothesis 2A ( $r = 0.578^{***}$ ,  $n = 48$ ), which assumed that there was no impact of "Japanese car assemblers" on the degree to which the "characteristics of the Learning Organization" existed at component suppliers in Great Britain. This strongly significant impact of "Japanese car producers" was emphasised by the fact that almost no positive significant correlation could be found for non-Japanese car producers.

An additional finding after more detailed analysis revealed that, although Null Hypothesis 2A could be rejected for Nissan and Toyota, this was not the case for Honda. This could best be explained Honda's history, which, due to a late entry into the automotive industry in Japan in the mid 1960s, could rely on suppliers already trained by Toyota and Nissan.

## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

Therefore, Honda apparently never had to learn to teach any characteristics of the Learning Organization to its suppliers in Japan in the way Toyota and Nissan had to do it. The case looked slightly different in Britain: Honda helped out suppliers by sending occasionally experts to their plants to fix production problems. But, Honda also employed a strategy to teach its suppliers in Britain by initiating co-operation between them and Honda's suppliers from Japan. This could be concluded from the interviews.

Correlation analysis of Hypothesis 2B revealed that Null Hypothesis 2B could be rejected, as the correlation coefficient between "Japanese suppliers as owners" and the "scale of the ten Learning Organization's characteristics" of component suppliers in Britain was weakly significant ( $r = 0.215^*$ ,  $p = 0.073$ ,  $n = 47$ ). This suggested that the relationship with Japanese car component suppliers as owners had a weak positive impact on the suppliers' characteristics of the Learning Organization. This interpretation was underlined by the fact that there were virtually no positive significant correlations with parent companies from other nationalities.

There were some explanations for the findings of Null Hypothesis 2B. Firstly, there might be a higher reluctance in a take-over to exert power, as the risk of failure is very high. Secondly, it might be that the explicit and especially tacit knowledge about Learning Organizations might be harder to transfer via a supplier as an owner. Lastly, the transfer of the Learning Organization's characteristics from a Japanese supplier was only an indirect transfer of knowledge, originating from Japanese car producers.

Correlation analysis of Hypothesis 2C showed that the corresponding Null Hypothesis 2C could be rejected ( $r = 0.345^{***}$ ,  $p = 0.009$ ,  $n = 46$ ) as the correlation coefficient was strongly significant. This was interpreted as that the relationship with "Japanese car component suppliers as co-operators" had a positive impact on the degree to which the "characteristics of the Learning Organization" could be found at suppliers in Britain.

The multiple regression analysis of Hypothesis 2A&B&C showed a highly significant impact of Japanese car companies on the Learning Organization's characteristics of component suppliers ( $bc = 0.638^{***}$ ,  $n = 31$ ). And 47% of the observed variability in the Learning Organization's characteristics of the component suppliers in Britain could be explained by their relationship with Japanese companies.



## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

This multiple regression analysis demonstrated the **dominance of Japanese car assemblers as the important source of the Learning Organization's characteristics of supplier in Britain**. This was compared to Japanese suppliers as not significant sources, in form of either a parent company ( $bc = -0.019$ ) or a co-operating company ( $bc = 0.233$ ), although the latter came close to be weakly significant.

A multiple regression analysis of the impact of Japanese companies as sources, combined with resources for change and receptivity to change, on the scale of the ten Learning Organization's characteristics indicated two significant beta coefficients. This was all "Japanese car companies" as a source ( $bc = 0.585^{***}$ ), but also "top management's receptivity" as a nearly significant facilitator ( $bc = 0.519^*$ ). This time even 52% of the variation of the "scale of the ten Learning Organization's characteristics" could be explained by the existence of links to "Japanese car companies", together with the "resources for and the receptivity to change" of the suppliers.

In summary, the empirical testing of Hypothesis 2 via sub-hypotheses produced significant evidence that Japanese companies in the car industry were a knowledge source for the characteristics of the Learning Organization's characteristics for car component suppliers in Britain. The correlation coefficients were strongly significant for Japanese car producing customers or co-operators of car component suppliers in Britain (the latter could also include Japanese competitors), but only weakly significant for Japanese suppliers as owners.

The outcome of the multiple regression analysis matches the assumption developed in Chapter 6, which suggested that Japanese car producers were the major sources of the Learning Organization's characteristics in the car industry. This knowledge was passed on to their own suppliers in Japan in the first instance, in order to improve their competitiveness, and, thereby, the competitiveness of the car manufacturers themselves. These Japanese suppliers then were the indirect source of the Learning Organization's characteristics, which had a weaker impact on car component suppliers in Britain compared to the Japanese car assemblers themselves.

Due to insufficiency of data, the sources of Japanese suppliers as customers, suppliers or co-members of supplier associations (including

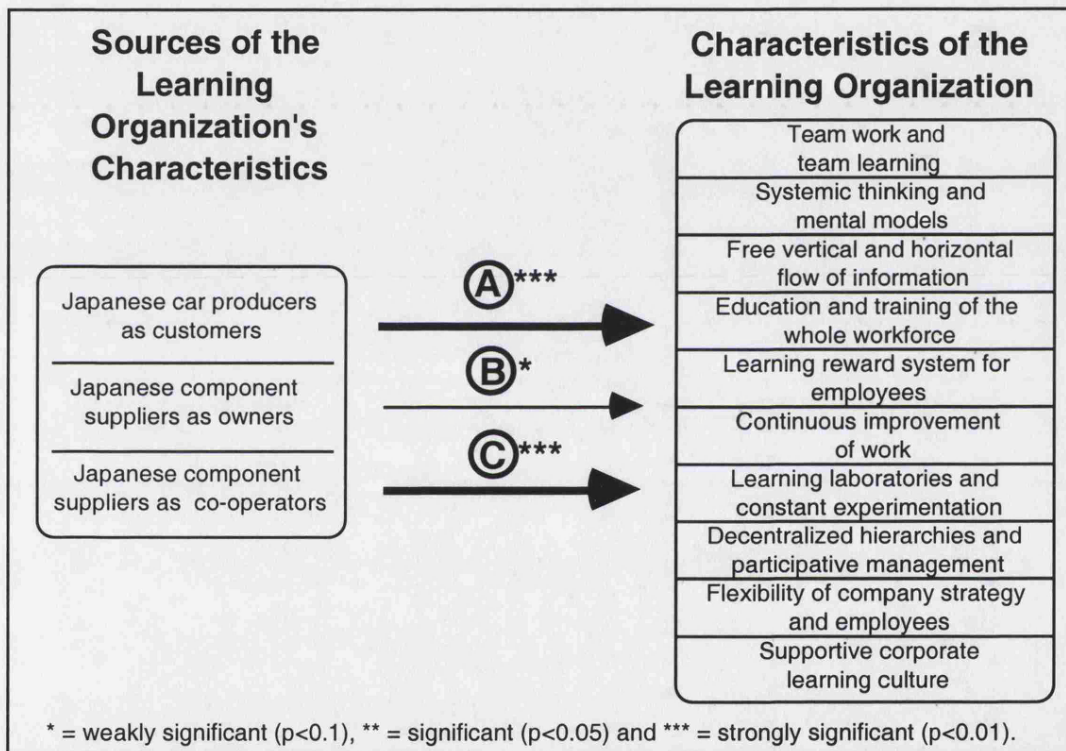
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## 8. DATA ANALYSIS OF THE QUESTIONNAIRE

competitors) could not be investigated in this empirical research approach. However, the theoretical argument as well as the exploratory and the in-depth interviews suggested that they all play a role in the process of acquisition of the Learning Organization's characteristics.

The results of Null Hypotheses 2 testing by correlation analysis are combined into one illustration, as depicted in Figure 8.20.

**Figure 8.20:** Influence of Japanese Companies on the Degree of the Learning Organization's Characteristics of Suppliers



Because of the limitation of the cross-sectional nature of the questionnaire, detailed analysis of the process of acquiring the characteristics of the Learning Organization was carried out with the help of in-depth interviews. This is presented in the next chapter.



## 9. In-Depth Interviews with Four Selected Suppliers

After the exploratory interviews in Chapter 7 and the questionnaire analysis in Chapter 8, Chapter 9 presents the in-depth interviews (for a guideline see Part 3 of the Appendix).

These in-depth interviews focus on the relationship between the sources (i.e. Japanese companies) and the characteristics of the Learning Organization (Hypothesis 2) as well as between the latter and organizational learning systems<sup>111</sup> and organizational learning outcomes (Hypothesis 1).

The reverse order of the hypotheses has been chosen as the data analysis of the questionnaire data in the previous chapter suggested some significant impact in this sequence.

The aim of this chapter is, on the one hand, to corroborate the major quantitative findings from the questionnaire analysis in a qualitative way and, on the other hand, to obtain a clearer picture of change over time of the companies involved. Latter includes the investigation of causal links more deeply than it was possible with correlation or regression analysis.

For the in-depth interviewing four car component suppliers<sup>112</sup> out of the 70 who completed the questionnaire were selected. Two people at each of the four companies were interviewed separately: they were normally a representative of the management and a representative of the shop floor workforce.

These four component suppliers were then divided into two groups.

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<sup>111</sup> The existence of an organizational learning system meant in this context that there had to be at least a team improvement system, which could include an employee suggestion system. The pure existence of a employee suggestion system alone was not seen to be sufficient, because it did not necessarily need any Learning Organization's characteristics to be implemented, as it was demonstrated in Chapter 8.2.

<sup>112</sup> A pledge of confidentiality was given to all companies and all people interviewed. Therefore, the six companies are labelled with Roman numbers "Company I" to "Company IV" and their representatives "Management Representative I" to "Management Representative V" (as there were two at Company IV) as well as "Shop Floor Representative I" to "Shop Floor Representative IV". For the same reason of confidentiality the women interviewed are referred to in the male form.



## 9. IN-DEPTH INTERVIEWS WITH FOUR SELECTED SUPPLIERS

The first group of two companies interviewed consisted of those two companies which had a high score in the Learning Organization's characteristics. They were examined because they were seen to be exemplary companies, and research interest focused on the description of the process by which they became Learning Organizations, i.e. successfully acquired the characteristics of the Learning Organization.

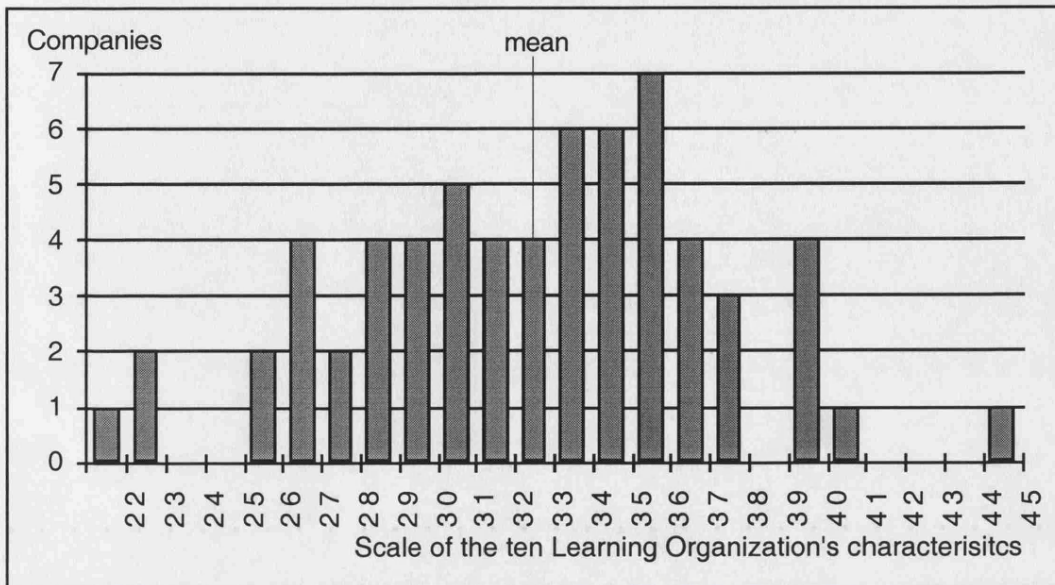
The other group identified were those two car component suppliers that had low scores in the Learning Organization's characteristics and indicated no relationships with Japanese companies in the form of customers, owners or co-operators. Here the interest was why these companies had that low scores and what prevented them acquiring the Learning Organization's characteristics.

As explained in Chapter 8, the scores on the scale of the ten Learning Organization's characteristics were obtained by summing the single scores of each of the ten characteristics. These scores were derived from the questionnaires. The first group of two suppliers selected for in-depth interviews had a value on the scale of the ten Learning Organization's characteristics of 40.0 (Company I) and 39.9 (Company II). This was at the top end of the company sample, as Figure 9.1 shows. The second group, with 22.8 (Company III) and 26.4 (Company IV) was at the bottom end. Furthermore, every value of the ten characteristics is presented in an overview for each of the four companies. However, it would have been beyond the limits of this thesis to show and discuss the score of every single answer.

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## 9. IN-DEPTH INTERVIEWS WITH FOUR SELECTED SUPPLIERS

**Figure 9.1:** Distribution of the Learning Organization's Characteristics



number of valid cases = 64

Most of the interviews, which lasted between 30 and 60 minutes, were combined with factory tours, which provided a better overall picture for the research and enabled an in-depth understanding of the organizational learning processes. Photos and charts in the factories as well as rearrangements of machinery, which were all explained during the tours, demonstrated the learning processes the suppliers with high scores of the Learning Organization's characteristics had undergone. This was especially the case for Company I, which will be introduced as the first of the two exemplary companies selected for in-depth interviewing.

### 9.1. Investigation of Company I

Company I had a high degree of the Learning Organization's characteristics (40.0). The interviews with Company I were conducted with the Personnel Manager (Management Representative I) and a young shop floor worker (Shop Floor Representative I), who had just been promoted to be responsible for the continuous improvement process. The factory visit revealed the teaching methods and techniques, which especially Toyota used, being a customer.

## 9. IN-DEPTH INTERVIEWS WITH FOUR SELECTED SUPPLIERS

**Table 9.1:** Descriptive Statistics from Company I's Questionnaire

No	Value	Variable	Average
(1)	5.0	Team work and team learning	3.0
(2)	4.0	Free vertical and horizontal flow of information	3.8
(3)	4.0	Education and training of the whole workforce	3.2
(4)	3.4	Systemic thinking and mental models	3.4
(5)	3.2	Learning reward system for employees	2.7
(6)	4.1	Continuous improvement of work	3.4
(7)	3.7	Learning laboratories & constant experimentation	2.9
(8)	4.4	Decentralized hierarchies & participative management	3.8
(9)	4.4	Flexibility of company strategy and employees	3.3
(10)	4.0	Supportive corporate learning culture	3.2
	40.0	Scale of the 10 characteristics of the Learning Organization	33.0

### 9.1.1. Sources of Organizational Learning at Company I

According to Management Representative I, the continuous team improvement system was imported by the management of Company I from Toyota, and also Nissan, in Japan:

“They went over there. They went to see their systems in operation. So, yes, most of the Directors went over there and then it cascaded down.”

This was seen more as a process of gaining business with Toyota rather than as a learning process. It started, according to Shop Floor Representative I, with resentment on Toyota's side:

“He [Company I's Managing Director] went over to Toyota [in Japan] about, four and a half, five years ago. And he went and knocked on their door and he actually said: ‘We want to do work for Toyota.’ They turned round and they said: ‘You can't just do it like that, you've got to get into the system.’ They tried to put



## 9. IN-DEPTH INTERVIEWS WITH FOUR SELECTED SUPPLIERS

him off a bit. But he was having what he wanted. They came over and they've been working with us ever since."

This shows that the persistence of the Managing Director of Company I played a major role in the process of gaining Toyota in the UK as a customer and teacher.

Shop Floor Representative I gave an outline of how Toyota UK taught the tacit knowledge of the Toyota Production System on the site of Company I. This was very much by socialising and not a very formal process:

"It was more of them coming in and showing us and telling us, working with us. They believed us, as I said, they were in a dark tunnel half way, they'd let go off our hands, return, and then we'd have to go the other half ourselves. But that's the way to learn.

Shop Floor Representative I illustrated this teaching process by Toyota with the example of introducing of just-in-time delivery:

"Well, basically, they came on the first time, they turned round and said what they wanted: 'Two collections a day.' That's the collections from off the deck, into the machine shop and back onto the deck. We did this. Three months later they came back, they said: 'We want to make it every two hours.' Reluctantly our Director turned round and said: 'Okay, we'll do it, see how it goes and see what the advantage is.' Various other points [besides saving space] were beneficial to us. Three months elapsed [and Toyota said:] 'We want it every hour.' Our Director turned round and said: 'We can't do that.' But we did, and now they see the benefits of it. There were no worse problems, that's all there is. Production space in the shop floors is a premium, we've got that many benefits from it. So they led us down the path and then let our hands go, and we had to go the whole way."

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This careful approach, by teaching with the extensive use of supporting personnel from Toyota and a careful step-by-step method, has been the key to this successful method. Both elements are important for teaching tacit knowledge.

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The personnel from Toyota knew what they were talking about, as they had experience with kanban and just-in-time production, and they were actually introducing it in Company I with a hands-on approach.

The step-by-step method ensured that a new pattern of behaviour was carefully inculcated and was first successful on a low level (double-loop learning, as it changed the framework of action), and then this new approach was steadily improved to the desired level (single-loop learning, as the improvements were taking place within the new framework).

These three conditions, i.e. a teacher, a step-by-step method and time, were absent 20 years before, when Company I wanted to introduce kanban with top performance in one go and fell 'flat on its face', according to Shop Floor Representative I.

Another interesting finding was the way Toyota introduced Total Productive Maintenance (TPM, for more detail see Senju 1992) for new machines in the Toyota production cell. The training of the employees of Company I as done with the help of a production cell solely producing for Land Rover, before the new Toyota production cell was introduced. This made the introduction of TPM easier in the Toyota cell, but it also helped to increase the efficiency of Company I on a whole, which indicates that Toyota concluded from systemic thinking that the overall prosperity of Company I was in Toyota's long-term interest.

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Another way of teaching used by Toyota was the promotion of continuous improvement. This was done by bringing suppliers together in a sort of supplier association, consisting of direct suppliers, which included Company I. Toyota UK selected one company, which chose a major problem to be solved. Representatives of the involved component suppliers then tried to solve this problem in a team. The process was described by Shop Floor Representative I as follows:

"I can give you one example. I went to a place called Brozer, and it's a purpose-built supplier for Toyota. And what they'd done, is they've got a kaizen activity up there called 'jishuken'. And basically it's a changeover kaizen, it's anything to do with changeover method. And they've introduced six companies separated round the country; they come together, they give them a project, and all six companies haven't met before. [We] got in the room, had a problem, they worked it out together. And the

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advantage of teamwork in that was displayed over a three-month period - it was unbelievable. And they actually achieved what they set out to do. And, Nakamura-san, who is a top bloke from Toyota in Japan, he came over for the presentation. It was extremely interesting. It showed the power of people joining to achieve things rather than as individuals. Toyota was demonstrating what teamwork can do, in the way, we as suppliers for Toyota can join up and use our experience in different fields to achieve what we want.”

The last part of the statement again shows the belief in team work and team learning as a superior method of solving complex problems compared to individuals working alone.

These common improvement exercises were also extended by Company I to those customers, who were also direct suppliers like themselves. This means Company I started to teach problem-solving to other companies for mutual benefit.

The statements above showed the importance of Japanese car assemblers, mainly Toyota, in the development process of improved organizational learning within Company I.

The input of Nissan UK, as another Japanese car assembler, was described as different from Toyota's efforts. Nissan was seen as being in favour of the organizational learning of Company I, but this did not involve active teaching. Management Representative I even went so far as to claim that Nissan did not want to share knowledge:

“Nissan, not too keen on it [teaching]. Well, they don't like giving anything away. Or that's the impression I've had.”

Although Nissan UK did not teach and train directly, he admitted that they cared about improvements, and even helped to improve the training courses of Company I:

“Yes, well, they [Nissan] come in to see you improve. And they visit us quite often. If we want to move a machine, let's say we just want to turn it round, they have to say yes. We can't even move it without their clearance. And they drive us towards better and better [standards]; they insist on the training programmes

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## 9. IN-DEPTH INTERVIEWS WITH FOUR SELECTED SUPPLIERS

that we write are written in their style. They've improved our training programme."

Company I also adopted the "5 Cs" from Nissan Japan (comparable to Toyota's "5 Ss", see also Osada 1991 for more detail), but Shop Floor Representative I could not remember all the words the "5 Cs" stood for:

"It's clear, configure, conformity, and there's another two, I can't quite remember."

However, that method of learning was an adaptation from different sources. According to Shop Floor Representative I the process went as follows:

"[The Logistics Manager] chose an American video and they call it the 5 Ss. Nissan called it the 5 Cs. We've amalgamated it and we've created our own: the good points from each. Because they've both got their good points."

Nissan UK's role, which was more of a pushing rather than a teaching nature, was described by Shop Floor Representative I to have been like this:

"They [Nissan] were pleased we're doing it [training], they were delighted we're doing it. It was one of the things they suggested we do."

The question regarding a system of spreading the knowledge generated had different responses. Whereas Management Representative I claimed that it was just recently under discussion, Shop Floor Representative I said it was already installed:

"What we do then is we meet on a weekly basis, or a monthly basis, and we'll actually action certain people out, who are showing promise within an area, to go out and do a kaizen on another area. For instance, one person at the moment is the team leader. He's been showing good skills with this kaizen. So what we've turned round and decided is, he can go into the foundry and do a kaizen activity on [a different] site. And his information is brought back in weekly reports, presented at a monthly meeting, and it goes to all the relevant areas."

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This means that there are weekly and monthly reports about successful continuous improvement projects, although it was not obvious to everyone that they serve the purpose of spreading newly-acquired knowledge.

### 9.1.2. Change in the Characteristics of Company I

Management Representative I admitted that, despite the trend towards team work, some of the employees would not change to team work, however, this did not mean that they would be made redundant:

“So there’re other areas still to improve, still to go into teams. There are certain people still working here that will never make team workers. So, we will have those until they retire. We won’t sack them, we won’t get rid of them. It’s, they’ve worked with us for so long. If they don’t make a team member, then we have to find them a job where we don’t need a team member.”

The beginning of this statement also implies that despite the big changes Company I has gone through there are still a lot of changes to be made. Although Management Representative I admitted that the change process had been more or less initiated by top management and customers, he saw this change as being bottom up, despite the obvious help:

“The company itself develops, and I doubt whether senior management would agree with me, but develops bottom up, not top down. It’s driven from the bottom. It means that the worker tells somebody what he wants. You’ve got the target up for their training and development. And the worker will say ‘I want that filled in’. And the manager then is driven towards filling it in. In other words, giving him the training.”

There was a trend in improving training of employees in recent years, according to Shop Floor Representative I:

“The main thing for me within the last, I’d say, 18 months to two years, is the development of the people who are working in the training side of it. I feel it’s improved. It’s improved definitely for myself. And other people feel it’s improved. Like five years ago we’d never have had anybody going into the meeting room and having a day’s course on training, that was just not heard of.

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So our company is changing. We can't afford not to train. So that's my biggest single point, it's training."

There was also a more informal way of exchanging implicit knowledge between different areas of Company I, which was made possible by rotating people, which themselves had to become more flexible:

"All the people on the cells are encouraged to work in other areas [of the site], they're trained. So they'll be working one week in one area, two weeks later they could be in another area. So they'll take their ideas and that way it gets around as well."

Due to the influence of the relationship with Japanese car assembling customers, a new training programme was introduced in Company I, which dealt with methods of enhancing problem-solving, such as communication, kaizen (continuous improvement), kanban system, pareto charts, parts per million (PPM) return analysis, etc. The training programme was initially started at the top of the company and now was available on the shop floor as well. Communication depicted an integral part of the new training programme:

"It's a day course, [it] lasts ten hours. So they train in communication. Also, now we have weekly meetings, monthly meetings and management and the directors come to the meetings as well. So there is communication now established at all levels."

According to Management Representative I, this course, which was described as "another Japanese idea", considerably improved communication in Company I. This knowledge is even shared with the local business school in the area, as part of Company I's philosophy to give back its share to society, which is an indicator of systemic thinking.

Shop Floor Representative I commented on the improvement of communication in his company as follows:

"It [communication] is improving. As I say, like on the VW cell [i.e. production area for VW products only] they never had daily team briefs. They never had a night shift liaison book. And all that's been introduced."



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An example of spreading the knowledge of a team improvement is given by Management Representative I, but he also indicated some lack of structure in this process to get knowledge from one area to another:

“Well, I’ll give you an example about this: we had a snap coupling. All of our dies, they’re high-pressure dies, and they carry either water or oil under pressure through the die to cool or in some cases to heat it. And they used to take a long, long time to get on and off. And one of the teams had purchased a snap coupling, so they could just snap them on and off. So they won’t be screwing, just pulled it, shut off and the die came out. That’s been used more and more across the plant.”

A system that spreads information about newly acquired knowledge was under consideration at the time of the interview and was planned to be introduced in the near future. Management Representative saw scope for better official communication, as there was no information about continuous improvement team activities published. However, he was aware of possible problems in sharing knowledge:

“It seems stupid to me, for one team to reinvent the wheel, when another one’s already done it. And yet some of these teams take pride in what they’ve done, and they don’t want others to use it.”

### 9.1.3. Learning Systems and Outcomes at Company I

Company I introduced its continuous improvement system in 1990. This outcome showed a continuous growth of implemented team improvements, from 6 in 1990, over 18 in 1992, to 40 in 1994 (0.012, 0.035 and 0.078 team improvements per employee, respectively). Management Representative I described the reason for the introduction of the continuous improvement system as being customer driven:

“I think we were driven by the customer to be quite honest. If you’d have taken us in, say 1985, if the customer said to us we’ve got 4% scrap, he’d say, well that’s great, that’s good. The customer doesn’t say that anymore. He wants it in parts per million, he wants zero reject. And the only way you’re going to do it is continually improve the process, kaizen, you’ve got to

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every time improve the process. I'll give you an example. A die change, before we operated on it, would take five to eight hours. Now we can do it in 45 minutes. So it's continuous improvement. And we say it should be done in 20 minutes, so we've still a long way to go."

The continuous team improvement system started by having a team leader elected by the team or selected by management. The latter proved to be superior for Company I:

"We've found that every team leader that has been elected by management has worked, most of those elected by the team have not, because it's normally the one that shouts the loudest."

It looked different with the employee suggestion system, which was overhauled in 1987. Despite this improvement, Management Representative I was not convinced that it worked properly:

"Before '87 it [the employee suggestion system] really didn't exist. It was there, you could put suggestions forward. Management didn't read it very often, in my opinion, that's just a personal opinion. Now, they run, and suggestions, a lot of suggestions, do go in and are responded. But I still think it's the wrong system. What I'm saying is, I think if you talked to some managers, they say, yes it works well. I don't see it. I mean when it first started you'd see some names go up on the board, so-and-so was awarded so-and-so. You don't see it anymore. When you talk to the workers, now I do that a lot obviously for training, if they talk about it, they rubbish it, they say it's no good. And I think unless it's accepted as a good idea by the workers, nothing's going to move it. And I would say it will die."

He further complained that the responsible people did not regard suggestions for small improvements as real suggestions, which caused a reluctance within the company to propose small improvements.

In 1994, only 15% of employee suggestions were implemented and Management Representative I explained:

"I think the take-up is low because limited people are putting [ideas] into the suggestion scheme, and they're putting it in

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without much forethought, in my opinion. And I've seen a lot of ideas away from their own area, not properly thought out."

In addition to the lack of employee suggestions, which were useful for general employee issues, the lack of attention to small problems was also criticised by Management Representative I. He saw the attention to small improvements as the advantage of the Japanese way of working:

"But the new way of working is basically the Japanese way of working. The Japanese way of working is that everything you change is a suggestion - not just the big things."

Shop Floor Representative I showed some admiration for the suggestion system of Land Rover, because it was very popular with the Rover shop floor workers, with whom he had contact. The workers at Rover told stories about the huge sums of money they had gained from their improvements. However, Shop Floor Representative I also saw that there was the danger of looking only at the big improvements at Rover. He admitted that he was not participating in the actual employee suggestion system of Company I (not to be confused with the team improvement system).

Describing the continuous team improvement process at Company I, Shop Floor Representative I explained the method of indirect monetary rewards within the company:

"They [the operators] want to improve their area. And by doing that it creates cell ownership. So eventually they'll improve their work output, which will increase their bonuses, so they will get more money."

This did not apply to all cells. This picture was different to the view of Management Representative I, who claimed that there were no monetary rewards at all:

"And we're surprised, we expected to have problems where we didn't pay them. But there isn't a problem."

It became clear, however, that Company I did not give any direct incentives for the continuous team improvements implemented.

For Shop Floor Representative I, continuous team improvements (kaizen) have more important benefits to offer than money:



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“The biggest point about kaizen: it creates a team atmosphere. They go in together, they brainstorm together, the ideas are put together and they carry them out together. So the main thing is [that] cell ownership is created, team spirit is created. Money is an added bonus.”

It was also interesting to see that Management Representative I highlighted the benefits of continuous team improvements (kaizen) in the working conditions of team members and that these were not only the company's goals of increased effectiveness and efficiency. This suggests a more systemic type of thinking similar to Toyota, which is not only focused on direct benefits to the company:

“The kaizen [continuous team improvement] activity is to make your job easier, to be better. Because we're now very much structured into teams, team orientation is improving your team pride in a team. And that's why they come up with the ideas, there's no money in it at all. There is in the suggestion scheme, or there are prizes in the suggestion scheme. But kaizen is to improve your system and make it a better working place.”

According to him, other motivators to join continuous improvement team activities were recognition, which he saw as being the best reward available, and competition between teams:

“But they're taking pride in it, where they can improve it. Each team wants to be the best and a kaizen activity will make them better.”

And although there was no official “no-lay-off” policy for rationalized jobs, there was an implicit understanding that these redundant people were going to be employed somewhere else in the company. This is again an indicator for systemic thinking about negative sides-effects.

In summary, Company I confirms most of the findings of hypotheses testing of Chapter 8 and also illustrates these in more detail.

Induced by the persistence of the Managing Director of Company I to gain business with Toyota, it played an important role for teaching the characteristics of the Learning Organization to Company I. This teaching

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was done with the help of close personal co-operation to ensure the transfer of tacit knowledge.

Nissan, however, played a more passive role in the teaching process, and preferred to stay on the explicit side of teaching. This is a good explanation for why Toyota has at least the same impact as Nissan on the characteristics of the Learning Organization of car component suppliers although Nissan has been in Britain much longer than Toyota<sup>113</sup>, as demonstrated in Chapter 8.

*well, it's an hypothesis!*

This teaching of Toyota helped Company I to acquire the characteristics of the Learning Organization. The step-by-step method ensured that the a new pattern of behaviour was carefully trained and was first successful at a low level (double-loop, learning as it changed the framework of action). Then this new approach was steadily improved to the desired level (single-loop learning, as the improvements were taking place in the new framework).

The changes in characteristics happened especially through a complete change in corporate culture that put the management into the position of being facilitator for the work force. This also included the improvement of communication and the introduction of extensive training.

The preferred improvement system was the continuous team improvement system (kaizen), as the employee suggestion system did not show the desired results. Whereas the former system did not include any direct monetary incentives, the latter did. This shows again that money is not a guarantee for a successful improvement system. Other important factors are team work and competition as well as job security, when efficiency improvements make positions in one area redundant. These insights are in line with the findings of Chapters 7 and 8.

The next company presented had also high scores in the characteristics of the Learning Organization as well as organizational learning systems.

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<sup>113</sup> It seems that Nissan has recognised this inferiority of teaching compared to Toyota, as they have started a programme of supplier improvement since the beginning of 1996 (FT 13-12-1995).

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### 9.2. Investigation of Company II

Company II had, like Company I, a high degree of the Learning Organization's characteristics (39.9) and received no teaching from Nissan, but from Toyota. The in-depth interviews with Company II were conducted with the "Total Quality Facilitating Manager" (Management Representative II) and a shop floor worker (Shop Floor Representative II).

Table 9.2: Descriptive Statistics from Company II's Questionnaire

No	Value	Variable	Average
(1)	4.0	Team work and team learning	3.0
(2)	4.3	Free vertical and horizontal flow of information	3.8
(3)	4.5	Education and training of the whole workforce	3.2
(4)	4.4	Systemic thinking and mental models	3.4
(5)	3.2	Learning reward system for employees	2.7
(6)	3.9	Continuous improvement of work	3.4
(7)	2.9	Learning laboratories & constant experimentation	2.9
(8)	4.5	Decentralized hierarchies & participative management	3.8
(9)	4.4	Flexibility of company strategy and employees	3.3
(10)	3.9	Supportive corporate learning culture	3.2
	39.9	Scale of the 10 characteristics of the Learning Organization	33.0

#### 9.2.1. Sources of Organizational Learning at Company II

Shop Floor Representative II reported no direct training from Nissan, as its orders do not appear to have been of sufficient size to warrant training Company II's employees for Nissan. But besides sending people for fixing specific problems, Nissan chose to undertake an indirect way of teaching and training via their suppliers:

"Nissan doesn't train, they will come and give advice. A 'thousand' people will come in and jump on the organization, they will come and explain things they would do that perhaps we



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have done wrong. Because we are quite forward looking, they will look at our systems and agree or disagree with them. Nissan tends to send some of their suppliers."

There was no learning going on as yet with the new Japanese member in Company II's group of companies. However, Company II benchmarked itself in some areas with data available from other Japanese companies.

Management Representative II stated that he was getting training from the parent company in the United States, provided by some external American consultants. The rest was self-study:

"It was very much self-study, going to college and doing night classes on quality, and running the little part of the department that I had in a total quality fashion and being able to relate what I did there."

After looking into the sources of organizational learning, the next section deals with the change in the organizational characteristics.

### 9.2.2. Change in the Characteristics of Company II

With the arrival of the new Managing Director in 1992, the change of Company II started in the view of Management Representative II:

"Some of the things he [the new Managing Director] came up with when he came and gave his first address to people, he said people will change or they will be changed. He put over the message very clearly we need to be a team to develop the organization, or we will not survive."

Management Representative II describes the structure of Company II as now being very team centred:

"The steering committee [the top of the organization] is broken up into: general manager, UK manager, operational excellence champion, manufacturing champion, logistics champion or inventory champion, quality champion. And to the side of that we are introducing technical excellence and customer excellence, they are two things that are going to be slotted on the side, although it sounds stupid that we haven't got that. So I generally manage a meeting on a fortnightly basis where each of these

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parties come together and report on the things we have done against target. They have a number of teams, so if you think of an organization instead of it being mixed into different departments, its mixed into different processes.”

Management Representative II described communication as initiated from the top, but with growing room for feedback from the bottom:

“It [communication] starts from the brief that is originally written by the senior management group on the Monday morning. It gets added to, and it is anything from visitors to business processes. It is very much hierarchical floor down and the manager gives it to the supervisors, and then the supervisors will stop the business on a Wednesday for 15 minutes. Supervisors read this out or go into conference rooms, which now happens, and talk to the people in-depth and get feedback questions from them.”

Being aware that some of the communication problems in the past were mainly related to growth, Management Representative II now sees some change happening. This is mainly directed towards formalization of communication (e.g., notice boards):

“The business has grown quite quickly. It has been growing for quite a lot of years and then you have big jumps. We were getting to a stage where employees didn’t know one another. I find it difficult now, because I don’t know who they are. So we have to let them know systematically more information about the business. It has progressed through that and we are ready for the next stage of employee involvement, it is something called ‘the line for success’. That is looking at the real measures of the organization, put notices up on boards, based on our objectives and saying: ‘OK, this is how we meet those objectives.’ If we can reduce down time, then we can increase productivity.”

Communication was described by Shop Floor Representative II as being good vertically, but with still some scope for improvement horizontally, describing the annual speech of Company II’s Managing Director:

“If it is about work on your line then communication is really good. He [the managing director] was telling us what we are

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going to be doing. He was just telling us what he wants us to do. He asked everybody if they had questions. We were just there to listen and not ask any questions.”

Shop Floor Representative II was trained as a facilitator for continuous team improvement activities in one week. He is now able to train other co-workers:

“I went on a training course, do presentations, one to one training, teaching people the knowledge we know.”

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After describing changes of some characteristics of Company II, the next issue are the organizational learning systems.

### 9.2.3. Learning Systems and Outcomes at Company II

Shop Floor Representative II described the continuous team improvement system as follows:

“For people to learn by their mistakes, you could pass on continuous improvement, quality and communicate with everybody. So if they had a problem you could solve it. Just to make things better.”

In Company II, like in Company I previously, new jobs were given to those employees whose positions were made redundant by improvement suggestions that had been implemented. However, this policy was only limited to the shop floor and has not been applied to office workers so far.

According to Shop Floor Representative II, the procedure for the implementing improvement suggestions depended on the size of the problem. Smaller ones were solved directly with the help of the supervisor, larger ones involved the business centre manager and was facilitated by regular (weekly) team meetings.

Management Representative II outlined the learning that took place in the process of implementing the continuous team improvement systems. It initially was focused only on big projects, which were harder to find the more were implemented successfully:

“We have quality circles, and like a lot of companies who have quality circles [we are] looking for people all over the



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organization, looking for a project that they wanted to work on. Now, big projects don't happen all the time. It is great for people to say there is always continuous improvement and there is, but there are no big projects for the ordinary person to work on. What we said is, let's train everybody in continuous improvement tools and train everyone, so we did. I spent three days with everyone in the organization, groups of 20, teaching them: tools, total quality, what the vision is, where we would like to be, what is their role in the new business, new organization, etc. So we set up the teams and what did we do? We did the same thing. Pick a project that you want to work on. And we saved £100,000 on these projects, but we spent a lot on training."

Company II introduced new methods which helped them to become aware of not only big but also small new problems and solve them in a semi-structured way. This included tree diagrams, Motorola's six sigma quality level, 5 Ss<sup>114</sup> and re-engineering. Using all these methods, which might appear somehow fragmented, is an indicator of a self taught learning process of explicit knowledge, without a guiding company which transfers tacit knowledge through personal interaction.

The employee suggestion system was overhauled in 1994, and, according to Shop Floor Representative II, it worked as follows:

"If you had a suggestion on how to save money and make the job better, we would work out how much it would cost to improve it, how much the job was. And then you would get a share of the money."

Management Representative II, however, admitted that the overhauled employee suggestion system was not successful at all, because it was flawed from the beginning and had to be replaced only one year later (in 1994 implemented employee suggestions, with 0.011, were nearly ten times lower than implemented team improvements per employee, with 0.094):

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<sup>114</sup> The Management Representative explained: "5S is a process of looking at your own area, the S is you sort through and sort out your area, you set limits and locations, you shine things clean, you share the information and then you stick to the rules." (For more information about 5Ss see Osada 1991.)

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"We were told by corporate [head quarters] we had to have an employee suggestion scheme because it is a TQ thing to do. So we benchmarked a few companies and we copied Rovers. It was the worst thing we could ever do. It was based on 20% of the savings that you could make. Managers said it was their job, the people said it wasn't. Some people got figures from here and some people got figures from there, no one got paid out and there were no savings made."

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The new replacement for the suggestion system was seen to be 5 Ss. The training was not done by Nissan, but by a European consultancy. Despite the high level of responses within this programme there was the impression that it had a one-off effect, though a significant one. Questions relating to mechanisms on how to keep the process going did not receive convincing answers. This feeling was confirmed during the factory visit where charts showed a plateauing of the improvement process of this 5 Ss employee suggestion system.

According to Shop Floor Representative II, there was no system installed to spread the newly-gained knowledge within Company II, although there were occasional meetings between people of different areas and hierarchies. Although Management Representative II claimed the same, the interview with him revealed that there actually were bi-weekly meetings of the people who were responsible for a certain area of the business (i.e., manufacturing, logistics, quality, etc.). This ensured not only the transfer of knowledge in one area of Company II's value chain to others but also between different areas. There were also annual knowledge share fairs to meet and exchange ideas regarding improvements of the whole group of companies to which Company II belonged.

In summary, Company II did not have the opportunity to acquire tacit knowledge about the Learning Organization's characteristics directly from a Japanese car assembler. This could be a major reason for the fact that improvement initiatives had to be generated alone in a sometimes painful trial-and-error process.

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Both, Company I and II had problems running their current employee suggestion systems, but they were considerably successful with their team improvement system. These were backed by a high degree of the



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characteristics of the Learning Organization, such as Chapter 8 has suggested.

The following group of the last two companies to be looked at had a low score in the Learning Organization's characteristics.

### 9.3. Investigation of Company III

Company III had a very low score in the Learning Organization's characteristics, with a value of only 22.8. The interviews were conducted with a Personnel Manager (Management Representative III), who also completed the questionnaire, and a shop floor worker (Shop Floor Representative III). The factory visit in this case was very helpful, because from the production batches and cell sizes it was easy to conclude the number of car component customers as possible sources for the Learning Organization's characteristics.

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Table 9.3: Descriptive Statistics from Company III's Questionnaire

No	Value	Variable	Average
(1)	1.0	Team work and team learning	3.0
(2)	3.9	Free vertical and horizontal flow of information	3.8
(3)	1.8	Education and training of the whole workforce	3.2
(4)	2.8	Systemic thinking and mental models	3.4
(5)	2.2	Learning reward system for employees	2.7
(6)	3.3	Continuous improvement of work	3.4
(7)	2.0	Learning laboratories & constant experimentation	2.9
(8)	1.7	Decentralized hierarchies & participative management	3.8
(9)	1.4	Flexibility of company strategy and employees	3.3
(10)	2.9	Supportive corporate learning culture	3.2
	22.8	Scale of the 10 characteristics of the Learning Organization	33.0



9.3.1. Sources of Organizational Learning at Company III

Although Honda UK was a client of Company III, it became obvious during the factory visit that the products ordered were only in comparably small volumes and only little value was added to these car components by Company III. Thus, and because of the finding in Chapter 8 that Honda generally did not train, Company III neither received any help nor any training from Honda, also not indirectly via its Japanese suppliers. This again suggested that the economics of training, i.e. the pay-off, play an important role in the decision-making process of Japanese car assemblers to teach suppliers the characteristics of the Learning Organization, or to help with the introduction of continuous improvement systems. *assump-  
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According to Management Representative III, although Ford demanded the introduction of a continuous team improvement system, they did not actively help in establishing one. Instead, Ford prompted the organization to establish a workshop with a European consultancy for one week, in 1994. This training was only for a team of ten people from Company III, and Management Representative III was the only one of that team, who actively tried to spread this newly gained knowledge. His impression was that the implicit knowledge gained from this training was not sufficient to establish a continuous improvement system in Company III:

“So we tried to continue with kaizen, but I didn’t feel I had enough knowledge. I felt very inexperienced, and it kind of stopped. Then we had an external consultant, who used to work for Ford, [he] would come in to the company fairly often. And I got talking to him and said that I wanted to continue with kaizen, but I didn’t feel that I had the experience. So he organized another workshop.”

This additional week of training in 1995 still comprised only about 15 people from Company III and it did not include training these people in a multiplier effect like in Company II. This time the drive neither came from Ford nor the top management, but from the shop floor. Top management gave no backing and was more interested in the high quantity rather than the high quality of the products:

“Then we continued with kaizen, but the interest came from us rather than the management. And most people felt that they

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couldn't leave their work, they felt pressurised to work rather than get involved with kaizen.”

Shop Floor Representative III noted that the process of continuous team improvement systems “fizzled out” after its introduction. Management Representative III saw one of the major reasons for the failure of the introduction of the continuous team improvement system (kaizen) in the lack of backing from top management to change the corporate culture towards a supportive environment, i.e. nurturing the characteristics of the Learning Organization:

“There isn't a common goal. If the goal was ‘we need quantity and quality, and to get this we need to improve the processes to work together as a team,’ and if the board of directors were to publicly state this, so that everybody could perhaps relax and say: ‘right, okay, I can become involved in kaizen, I can do this.’ If it was accepted and everybody knew what this goal was. I think that is the culture that is missing. At the moment people don't understand what they can do, or what they should do. We do need to change the culture, change attitudes.”

As a supportive organizational culture is one important part of the characteristics of the Learning Organization, this leads directly to the next issue, which is the change in the organizational characteristics of Company III.

### 9.3.2. Change in the Characteristics of Company III

Communication was described by Management Representative III to have been changed, away from an informal approach:

“The changes that have occurred have been that it was very much a family-type business, where everybody knew everybody. And a lot of people were related and communication was a lot easier, because there were fewer people. And it would be in the canteen, everybody could hear if something had happened.”

This change, from a family business to being part of a group of companies, was followed by a transition period of strong growth:

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“Now, well, we went through a period of perhaps two or three years, where it was total chaos. There was too much work, not enough people, even though there were more people, there still weren’t enough people. A lot of overtime, a lot of pressure, no thanks, no recognition, no communication, you just did your job - very, very hard.”

Communication took place bottom-up, informally and normally only when employees’ complaints were expressed:

“Management got to know about the shop floor through some people, only some, approaching them and complaining. Well, it’s very, very informal. Sometimes the cell leaders will have a meeting and complain. It’s usually complaints to the supervisor, who then will pass it on to management. Sometimes a manager will be present in the cell leaders meeting and they will hear that way. Sometimes a manager will come down on the shop floor and just walk around.”

The top-down information flow looked more formal at Company III:

“And the other way round, the management informing the shop floor, they’ve got [it] better, they’re putting more notices up on notice boards, like visitors. Just recently the Managing Director has put a notice up to say that he wants a newsletter issued three or four, or two or three, times a year. But that is formal information. Information from management tends to go down through supervisors to the cells.”

Compared to Management Representative III’s view about communication between different levels of hierarchy, Shop Floor Representative III saw communication within the shop floor level as good:

“Yes, there is a good communication, actually in fabrication on the shop floor. Not anywhere else as much, but definitely on the shop floor there is good communication.”

However, top-down communication was judged as being poor:

“There is not a good communication from the management to the shop floor, the communication is terrible, really bad. The thing is, right, the manager will probably have a meeting and they



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decide various things and it's probably going to be a memo or it will be orally. If it's a memo, it will go down to the supervisors, then to the cell leaders, which should be pinned up on a notice board. And sometimes, when the cell leaders forget to tell you that there is a memo from the works meeting, you don't see it. So it is not as if it comes straight down it passes along. And if it's orally it goes from boss to supervisor to charge hand to cell manager, and within this time it can either be changed or forgotten. It's not direct. But we do get memos, but the managers should come down and make sure that everybody is aware of it."

Despite the existence of bottom-up communication, for example the Managing Director comes to the shop floor every two weeks for a chat, Shop Floor Representative III did not think this has any real influence on management:

"For decisions management sometimes ask the workforce for their opinion, but they don't take any notice although they do ask. They do it their way anyway, they probably will ask."

Thus, from Shop Floor Representative III's point of view the characteristic "free vertical and horizontal flow of information" had scope for improvement. This was especially on the content side, which was not measured in the construct presented here, and showed a value (3.9) slightly above average (3.8). The observation reflects the findings of Chapter 8.2, which showed that "free vertical and horizontal flow of information" (constructed by forms of communication) was the only characteristic that had no significant impact on organizational learning systems.

Management Representative III experienced some changes in the training of Company III. There had been no training in the company since the beginning of the 1990s and compared to the other companies, it, therefore, had values well below average:

"And we had no training, whatsoever. As we got bigger, very quickly got bigger, they, the Board of Directors decided that they needed someone to train, someone to do introduction, to do training on the shop floor."

But, besides there being only one course on offer for statistical process control (SPC), there was also the openness to admit that getting the training

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going had many obstacles. This lack of training also contributed to the third failure in implementing a continuous team improvement (kaizen) system in Company III. Another reason was the fact that there was no time for the employees provided by top management to implement the system properly:

“Trying to get kaizen off the ground, continuous improvement philosophy, we did use a form of training charts called ILU<sup>115</sup>. [We were] trying to get that going, but not succeeding. The ILU charts haven’t been successful, because we needed to start again, from the very beginning and try and identify what the operations are. The cell leaders, who are the most important people within the group, are the best people to identify what these areas are. But unfortunately they’ve just got so much work to do. To try and take them away from the shop floor is very difficult, it’s virtually impossible.”

This impression of very little training at Company III was also given by Shop Floor Representative III, describing the training received:

“And we did last year watch a kaizen video, which I think was from Japan. We not really had any training. I’ve been here for three years and there has been no training. I came on the shop floor and we had charge hands. And they stuck you in and they didn’t really tell or show you how to do it properly. I embedded myself in a way. I watched the people, and they told me what I was doing wrong.”

### 9.3.3. Learning Systems and Outcomes at Company III

Company III showed interesting results concerning organizational learning outcome in the form of quality: whereas the internal quality was low, with 10% of the part containing failures, the external quality was considerable high, with a failure rate of only 0.05%. This was possible

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<sup>115</sup> ILU is a Japanese training system, which is also used in the automotive industry. Every line stands for an advanced training level, the order is I, L, U, O. An O with a line in the middle indicates the ability to train others (for the ILU matrix with more detailed information see Part 4 of the Appendix).

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because of heavy rework included in the production process. It shows how little interest in organizational learning exists. Root cause analysis to solve quality problems was not conducted. The organizational learning systems did not work and as such interrupted the organizational learning cycles.

As explained in the two sections above, the introduction of a continuous team improvement system was attempted three times at Company III, but failed to work. This was caused by the low values in the Learning Organization's characteristics, mainly because of the absence of backing from top management. Also, using a European consultancy which apparently had little tacit knowledge about team improvement systems as facilitator did not help. And although rejects were "a quite high problem in this company", Shop Floor Representative III openly admitted he had not been included in continuous improvement activities (kaizen):

"I have really nothing to do with kaizen. But I should imagine it is for continuous improvement, and plus things to make it a little bit easier, like if you could find a way of doing it easier or quicker. And everybody can give suggestions, like somebody can walk to some of the management and say: 'Look I find it easier to do it that way.'"

According to Management Representative III, the only reason for the work force to join continuous improvement activities at the moment was to "make their lives easier". Asked why the employees did generally not participate, the answer was:

"Because they know they wouldn't get thanked. They know they wouldn't get recognised. They know they wouldn't be rewarded. So the only reason to do it would be to make their life easier."

Shop Floor Representative III could remember two rare examples relating to improvements. The first one, however, showed that it did not tackle the real underlying problem of rejects, as the root causes were not fixed, only the outcome of the problem:

"I think somebody said something in our cell actually: 'See, what happens: if we make some rejects, they get reworked.' So they get sent out and get reworked. So one of the girls said: 'Oh, if we could maybe rework them by ourselves.' Like the end of the



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shift, you finish an hour before you go home, and then rework them yourself, so they are ready for the next morning.”

The second example of an improvement was as follows:

"Another thing was tooling. To make some parts you have to change your tooling four or five times, because there are different sizes of nylon, different end fittings. And what one suggested was, if we got a tooling that we haven't got to change, that was versatile, so that we could do the whole thing without changing the tooling. A bigger thing and maybe move it around. And that happened with one of [them], we have got something new now, which has actually helped us a lot to save time.”

And although the second example can be seen as a real improvement, it took about a year to implement. This extremely slow feedback might be another reason for the repeated failure in implementing the team improvement system. Employees are unlikely to be motivated for another improvement, before they see their first improvement successfully implemented, not to speak about the rewards.

The opinion of Shop Floor Representative III about the continuous improvement process was that there was no knowledge about it available in Company III to implement it properly. However, he also had thoughts about how to improve it, still only addressing explicit knowledge:

“I think it [the team improvement system] is a very good way actually, but I don't think that they have enough knowledge of how the kaizen works [*sic!*]. I mean we've seen a video and had a little discussion and talk about it. But, and then people forget, don't they? I mean, I think we would need a fortnightly newsletter, or something like this, going around.”

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There was no systematic approach of spreading newly-gained knowledge from continuous improvement activities within Company III. The transfer of an idea from one part of the company to another seemed to depend on pure chance. Management Representative III complained:

“That's what I think makes it so difficult, because there is no system [to spread new knowledge].”

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Shop Floor Representative III gave an example of how an improvement of another manufacturing cell got picked up just by chance. But the reason for the lack of knowledge flow was seen to be the work overload rather than missing systematic processes:

“It’s quite ironic really, because we do have a good communication actually in fabrication, but sometimes it does lapse. Like if you are doing something and then I come over to the cell and say: ‘Oh, that’s a good idea who told you that?’ They said: ‘Oh, we thought about it last week.’ I said: ‘Oh, we could have been doing that.’ On the whole, we have got a good communication in fabrication, but sometimes it does lapse. It’s just we are so busy at the moment, we have no time to do anything, really.”

In summary, the case of Company III shows four major problem areas which contributed to the failure of the introduction of continuous team improvement systems.

Firstly, there was no backing from top management for the introduction of a continuous team improvement (kaizen) system, neither in the provision of time nor adequate and sufficient training. This again led to a low scoring in the Learning Organization’s characteristics, which were hardly conducive to the running of a continuous team improvement system.

Secondly, a European consultancy, not very familiar with the tacit knowledge needed for the introduction of kaizen, trained the employees, which was not very fruitful.

Thirdly, there was only a relatively low number of employees in Company III, who were intensively trained for continuous improvement, and the training for the rest appeared to be very short and shallow.

Finally, the time needed for implementing one proper example of an improvement took about one year, which is much too long to keep employees motivated and, therefore, to keep the system going, i.e. the organizational learning cycles.

The continuous team improvement system was relaunched for the third time, when the questionnaire was completed. Half a year later, at the time of the in-depth interview, this third initiative had obviously failed once

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more, due to a lack of supporting characteristics of the Learning Organization. This was in line with the model developed, as it showed a highly significant impact of Organizational Learning characteristics on organizational team learning systems.

Despite the repeated failures of introducing organizational learning systems, Company III was acting in a sector of an industry which was growing, because the production of these kinds of products had been outsourced by car manufacturers to components suppliers. This implied high growth rates for Company III. In turn, this again made the pressure to change towards the model of the Learning Organization less urgent for top management, as they appeared to be successful with their current strategy. The case of Company III shows that an organization with considerable low values in characteristics of the Learning Organization can still be growing very successfully in a supportive environment, at least for a certain period.

The next and final supplier interviewed was in a more competitive environment than Company III, but was still very profitable and, therefore, also not very inclined to change.

### 9.4. Investigation of Company IV

Company IV had a low score in the Learning Organization's characteristics with a value of 26.4. The interviews were conducted with two Personnel Managers (Management Representative IV and V), one of whom answered the questionnaire, and one shop floor worker (Shop Floor Representative IV). There was also a factory visit from which it was possible to conclude that some change had taken place.



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**Table 9.4:** Descriptive Statistics from Company IV's Questionnaire

No	Value	Variable	Average
(1)	2.0	Team work and team learning	3.0
(2)	2.7	Free vertical and horizontal flow of information	3.8
(3)	3.6	Education and training of the whole workforce	3.2
(4)	2.3	Systemic thinking and mental models	3.4
(5)	3.0	Learning reward system for employees	2.7
(6)	2.9	Continuous improvement of work	3.4
(7)	2.0	Learning laboratories & constant experimentation	2.9
(8)	3.1	Decentralized hierarchies & participative management	3.8
(9)	2.5	Flexibility of company strategy and employees	3.3
(10)	2.3	Supportive corporate learning culture	3.2
	26.4	Scale of the 10 characteristics of the Learning Organization	33.0

### 9.4.1. Sources of Organizational Learning at Company IV

Management Representative IV described the process of change of Company IV as being dramatic and rapid. But as Company IV did not have the advantage of a Japanese role model for teaching them the Learning Organization's characteristics, all new knowledge about those and about organizational learning systems had to be gathered and adapted in a sometimes quite painful trial-and-error process: *care still not move*

“And really, it was a dramatic period within the company's history of change - very rapid, very quick. We had a lot of management off-site meetings at that point in time. Off-site, where you couldn't be attacked by the telephone. And we discussed a lot of the issues. So, if you like, the demands were put onto us. But a lot of what we've done from that point has been a result of our own interpretation of what the environment is doing and how we, if you like, bring it in with this culture of the company. I would say quite categorically, what we did initially was wrong. But I would honestly say that we learnt a lot from the experience, and in some circumstances put things right.”

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Although there was a Japanese affiliate in Company IV's group of companies, and another affiliated company in Britain which supplied Toyota, there was no inter-organizational learning going on between them. Management Representative V saw the reason for this in the internal competition:

"I feel we could live with each other. Unfortunately in some senses the political atmosphere in the group is competitive rather than co-operative - that's the typical situation."

According to Management Representative V, the support of a European consultancy was used for the introduction of a continuous team improvement system:

"Very simply, I mean, our approach at that time, not knowing much about continuous improvement, was to look around and see how we could approach it. And from our own perspective, a suggestion from me [was] that we could maybe use a consultancy to help guide us as it were."

The use of a consultancy to learn was not suggested by customers, like in Company III's case, but Company IV decided to go that way as there was no expertise in-house, Management Representative IV remembered. But using a consultancy with little tacit knowledge implied many problems for the introduction of a continuous team improvement system:

"In our particular case we decided to go for consultancy, basically because there wasn't the expertise here. Having gone for the expertise, the main problem with it, although we wrapped it up in the plan of continuous improvement, was that it tended to be very prescriptive. You know, they [the consultants] came in, they said: 'This is what you do, you do this, you do this, you do this.' And it was a prescription towards change. In other words, they stood up and told people: 'This is what's going to happen.' And it didn't happen the way they said it was going to happen. So, initially we started off on the wrong foot, because everybody had an impression of what improvement was about. And when things didn't happen the way that they thought it was going to happen, quite honestly, disillusionment set in quite quickly afterwards."

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Going into more detail, there were a couple of problems linked with the prescriptive consultant approach, some of which were directly brought forward by Management Representative IV.

Firstly, there was only one Japanese technique (fishbone or Ishikawa diagram) taught to solve all kinds of problems. This was perceived as being sometimes too rigid, and it was not always appropriately applied. It could also be the case that the training for the use of the Ishikawa application was insufficient and, therefore, the technique did not show the desired results.

Secondly, the management reaction to install a team when needed was much too slow, and, because of that, employees quickly lost interest in the problems.

Thirdly, the initial momentum faded after its introduction, apparently due to a lack of backing by the Learning Organization's characteristics. Therefore, this approach was abandoned:

“Fishbone diagram, Ishikawa diagram - in some circumstances they may not have needed it. They might have used, for instance, process analysis, waste elimination, these sort of ideas. But because they were trained in a specific manner, everybody felt that they had to go this way, and it wasn't necessarily the case. And it fell into dispute, really from a number of points. First, the speed with which management could get round to assigning people to the problem. So, if someone came up and said, 'here is a problem', and if a period of time went passed before any action happened, then people just became disillusioned. So that was a particular problem. Keeping the momentum up, we found was very difficult - very, very difficult. Well, there was, as I say, this feeling that we were stagnating, I suppose, but the initial enthusiasm was waning a little, you know, moans and groans and complaints. And I think, you will always have a sector of people, who you have in the company, who aren't interested in change. And all that serves to fuel the inertia towards change. So, a lot of criticism was levelled at the consultants. And really we abandoned this prescriptive approach.”

Fourthly, the outside consultants provided relatively poor training, which seemed to have been off-the-shelf and initially designed for a management audience only:



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“For instance, the training that I saw that was happening, the quality of it was not very clever. It was targeted at the wrong audience, we were talking to people on the shop floor, and they [the consultants] were rude to you, talking as if they were delivering it to management.”

Fifthly, the volunteering of facilitators for the continuous improvement processes led to the selection of employees, some of whom were not even capable of reading or writing:

Again this [election of facilitators] is part of the problem. Initially they were volunteers. Now, don't get me wrong, I think volunteers, you know, is a good idea. But, for instance, one of the volunteers couldn't read or write. To try and co-ordinate, to organize meetings or write memos to people - impossible, obviously impossible. No disrespect to the person, he's a very enthused person, but you need obviously some base skills that the people need to do. And they'd [consultants] never even considered it.”

Management Representative V added a sixth reason for the failure of the introduction of the continuous team improvement system, which was that suggestions for improvements were often made for other areas than their own. On the one hand, this did not create ownership and the suggestions lacked insight, on the other hand, the employees affected saw it as an interference in their area:

“The other thing we did really very badly, was we tended to accept any idea, instead of saying we want ideas relevant to the individual workplace, where they're the experts and ideas which they ultimately will be responsible for implementing. So that's the point of one of the fundamental mistakes we made. Again, this stemmed from the consultants. And what we're finding is that by restricting it to the individual's working environment, you've got, first of all, more enthusiasm.”

This eventually led to the removal of the consultancy, and Company IV decided to approach continuous team improvement systems on its own. Sources then were visits to other companies, which ran these systems and also literature. Both forms, especially the latter, are vehicles for explicit

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but not for tacit knowledge. This lack of implicit knowledge was the major reason for why the degree of the characteristics of the Learning Organization was still very low in Company IV, although a continuous team improvement system was installed. This was, however, more due to the team in the personnel department as a spear head of change.

This does not mean that there was no change in the organizational characteristics, as the following section will show.

### 9.4.2. Change in the Characteristics of Company IV

Management Representative IV was convinced that Company IV was still in an organizational learning process, though more by evolution rather than planning:

“But a lot of what we were doing here sort of evolved, should I say, within the company. We wouldn’t specifically say that you’re going to do this, you can do this, you’re going to end up with that. We started to do it, and as the process of going in and getting involved with it, other issues started to emerge. For instance, we had a vague idea that what we wanted to do was to measure people’s abilities at the end.”

But there was another problem in the change and organizational learning process, which was caused by the fact that Company IV was rather successful in terms of profitability and, therefore, many people in the management did not see a real need for change.

The state and change of communication in Company IV was seen by Management Representative IV as not being without problems, but some training (which had a value above average) had been implemented now to improve parts of it:

“Well, we have a number of communication vehicles. We have employee consultation and council meetings, which involve representatives of the company a lot, who have been elected. But it’s a non-union situation. And then that involves operations director, myself and others. That are issues of general interest, if you like, developments in the company, new business, threats, opportunities in the organization. Team briefings we have, again

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we have had difficulties with team briefings, because of the industrial society model of cascading team briefings. Very much as Nissan found, we found that it started off very well, but after a year or so the supervisors and managers didn't have enough to say. More to the point, they were I think not trained very well, and we've now developed a training course for them."

Communication was also seen as problematic by Shop Floor Representative IV and with much potential for improvement:

"And I think they're trying to do something about it, but there is still a problem with communication. Management, I suppose, don't tell you everything, perhaps they shouldn't tell you everything. But then you've got to have some involvement, there's got to be a two-way corridor, between the shop floor and management. So perhaps they're working on it, perhaps not hard enough, but it's not easy. We are still having to ask what's going on, we're not being told. They won't voluntarily offer the information until it comes upon us, or we sort of drag it out of them in a sense. So, as I say, they are trying to improve the lines of communication, but, as of yet, I haven't seen a lot of improvement."

Management Representative IV reported that the change in the information policy towards more content was received differently by different employees in Company IV:

"We have people who, if you like, are against change and pro inertia, and they see it as a threat. And other people are quite open to it and, you know, were very grateful for the information that came out."

Despite a general lack in the characteristics of the Learning Organization, organizational learning systems were in operation in Company IV. However, both were not in good shape and as a consequence the results of organizational learning were low.



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9.4.3. Learning Systems and Outcomes at Company IV

According to Management Representative IV the introduction of the continuous improvement systems was due to market pressure:

“Basically to try and attain a competitive advantage, I would say. The reason for that is that there is a lot of pressure from the external market place in which [Company IV] competes. And a lot of our customers, people in the form of Vauxhall and so on, are striving towards competition with the likes of Toyota. And as a result, since we are in their supplier chain, it's impact on us was marked. And we either had the opportunity to, if you like, move towards continuous improvement or virtually kiss good-bye to Ford's and Vauxhall's business over a period of time. I mean, I'm not saying it would happen there and then, but over a period of time it would happen. So it was a case of making sure that we had a competitive advantage.”

That the old employee suggestion system was currently not working properly was without doubt for Shop Floor Representative IV:

“It was a long time ago, when anything was happening with that when I first started here. A few ideas came off the shop floor, but I don't think it worked very well, to be honest.”

Also Management Representative IV described the old employee suggestion system as not working properly. But, additionally he saw it as being inconsistent with the continuous team improvement system in Company IV, because it focused only on the cost side and the big problems:

“In fact many years ago we had a suggestion scheme, which was typical of many western organizations, which said the company would make a payment equivalent to 5% of the annual savings in the event of the suggestion resulting in cost savings of over £250 per year. We abandoned that a few years ago, because it was blatantly inconsistent with continuous improvement. The message it was giving was that only cost improvements were important, and only large-scale ideas were important.”

Additionally, the bureaucracy of the employee suggestion system limited its success. The new system, introduced later, was called the

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proposal scheme, in order to avoid any connotation of the old unsuccessful scheme, but its success still had to be proven.

The approach had been changed, and Management Representative V saw the new aim of the scheme to increase incentives for participation and not the outcome (which explains why "learning reward system for employees" was slightly above average):

"So what we're trying to reinforce was the mechanism, the involvement in continuous improvement, rather than the outcome."

Shop Floor Representative IV had a good opinion of the continuous improvement system in Company IV, although he was not participating:

"Continuous improvement? Well that seems to work pretty well. I wouldn't have said it's affected our department a lot, we haven't had a lot to do with it."

The fact that his department was not participating showed that the continuous improvement system was not working everywhere. This was despite the fact that these employees recognised the potential for improvements within their department:

"We work as a separate unit to the company. People approach us and we try and do what we can to help that. But the continuous improvement, what I've seen of it, tends to deal with the production line work, to speed up and to make it more efficient. Obviously we probably could improve things but it is running pretty well."

In summary, the case of Company IV shows how problematic the introduction of a continuous team improvement system with the help of an external European consultancy can be, which has no tacit knowledge to teach the implementation and running of organizational learning systems, not to speak about acquiring the Learning Organization's characteristics.

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The presentation of six major problems, mentioned in the in-depth interview by the management side as barriers against the introduction of a continuous improvement system, showed how difficult this process of self development by trial-and-error towards the ideal of the Learning



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Organization can be. But it also shows that it can be done, however, more slowly and painfully, and with more limited results, as shown in the previous cases.

The comments of Shop Floor Representative IV revealed that the continuous team improvement system still was not very firmly established. The reason could be found in the low degree to which the Learning Organization's characteristics could be found at Company IV. It was not an ideal environment for embedding this kind of organizational learning system, as the help of Japanese companies with their tacit knowledge was missing. But also, the good financial situation made many employees of Company IV less prone to change.

Company IV's continuous improvement system was launched by a small subculture group in Company IV and did not apply to all areas. This group might have had a higher degree of characteristics of the Learning Organization than the rest of the organization, which was indicated in the questionnaire. However, the successful performance in terms of profit of Company IV made it problematic to transfer the subculture onto the whole organization, as no urgent pressure for change was perceived by the rest.

### 9.5. Summary and Conclusion of the In-depth Interviews

All in all, these in-depth interviews showed various interesting points, which are summarized in the following paragraphs. The overall picture suggests that the outcomes of the hypothesis testing in Chapter 8 could be corroborated by the image gained from the companies interviewed. *have partly*

Firstly, the first two car component suppliers, i.e. Company I and II, revealed various insights into the structure of companies which have a high degree of the Learning Organization's characteristics and successfully employ organizational team learning systems. The preferred organizational learning system was the continuous team improvement system, as the employee suggestion system did not show the results desired.

The best explanation for this is the fact that there was no role model available from Japanese companies for employee suggestion schemes, compared to kaizen as a role model for continuous team improvement systems. As it turned out, tacit knowledge when teaching kaizen and the existence of the Learning Organization's characteristics supported this *Sh? is ok here?*



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process. Other important factors for the successful implementation of the team improvement systems were team competition and a certain job security when efficiency improvements made positions in one area redundant, which goes in line with the findings of Chapters 7 and 8. Furthermore, the long-standing bad experience with employee suggestion systems in the past did not make the revival of this option very attractive.

Secondly, the two suppliers of the second group in this chapter, Company III and IV, which indicated very low scores in the characteristics of the Learning Organization, received little backing from their top management to acquire these characteristics. It was useful to hear about the supplier companies from two points of view, i.e. not only from the Management Representatives' but also from a Shop Floor Representative, in order to obtain a more balanced view and better understanding of these companies.

Company III's low value on the scale of the ten Learning Organization's characteristics was responsible for the fact that the continuous team improvement system was about to fail for the third time when the questionnaire was being completed. Half a year later, at the time of the in-depth interview, this initiative had obviously failed again, because of a lack of sufficient backing through the Learning Organization's characteristics. These again were neither backed by top management nor a Japanese car assembling customer. Honda's refraining from teaching was apparently caused by the fact that the amount of business was too low and with little value added, so as to make it attractive for Honda as a customer to invest into teaching of its supplier. Furthermore, Honda had little experience in teaching its suppliers anyway, as Chapter 8.3 showed.

Company IV's low degree of its Learning Organization's characteristics did not support its continuous improvement system sufficiently on an organization-wide basis. In addition, it was launched by a comparably small subculture group of middle managers. This group was very enthusiastic about its work but it lacked a strong backing from top management as well as help from Japanese companies in the car industry. Therefore, the continuous team improvement system was not spread to all departments within the company.

In comparison, the first group of suppliers with a high degree of characteristics of the Learning Organization had, for example, in 1994 an

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average of 0.086 ( $= (0.078 + 0.094) / 2$ ) implemented team improvements per employee, which was 64% higher than the value of 0.052 ( $= (0.050 + 0.055) / 2$ ) from the second group with a low degree. This also shows that an organizational learning system performs much better with the help of a high degree of characteristics of the Learning Organization. Without this, <sup>so</sup> an organizational learning system, especially a team learning system, is <sup>now</sup> doomed to under-perform, or even fail. <sup>both the</sup>

Thirdly, it is helpful to compare the second group of companies with <sup>needed</sup> low scores in the Learning Organization's characteristics with the model of an incomplete comprehensive organizational learning cycle (see Figure <sup>is</sup> 9.1), developed in Chapter 2. In reality, these incomplete comprehensive organizational learning cycles mainly had their breaks either between (1) <sup>system</sup> individual learning and codification or between (2) codification and team learning and/or organizational learning. <sup>?</sup>

The breaks between (1) individual learning and codification were suggested to be caused by the fact that an individual is not capable, forgets or has no incentives to codify newly-acquired knowledge. In reality, the incapability was mainly caused either by a top management which was not inclined to change or by a lack of education and training or wrong training content, such as in Companies III and IV. And the breaks between (2) codification and team learning and/or organizational learning particularly applied to Company III, due to missing incentives for team learning in conjunction with high work pressure.

Interruptions between (3) team learning and generalization happened in Company III and especially Company IV (but also occasionally Company I) when the teams did not make their knowledge accessible to the whole organization. This learning block was caused by a lack of skills and training, no incentives for generalization or team competition. The breaks between (4) generalization and organizational learning because the organization was not willing to take up the generalization of team learning due to conflict with the dominating organizational culture, were the case for Companies III and IV.

As regards to severed links between (5) organizational learning and institutionalization, Companies III and IV showed that generalized knowledge could hardly be stored, as a large part of the organization was convinced that this newly acquired knowledge was not relevant for the

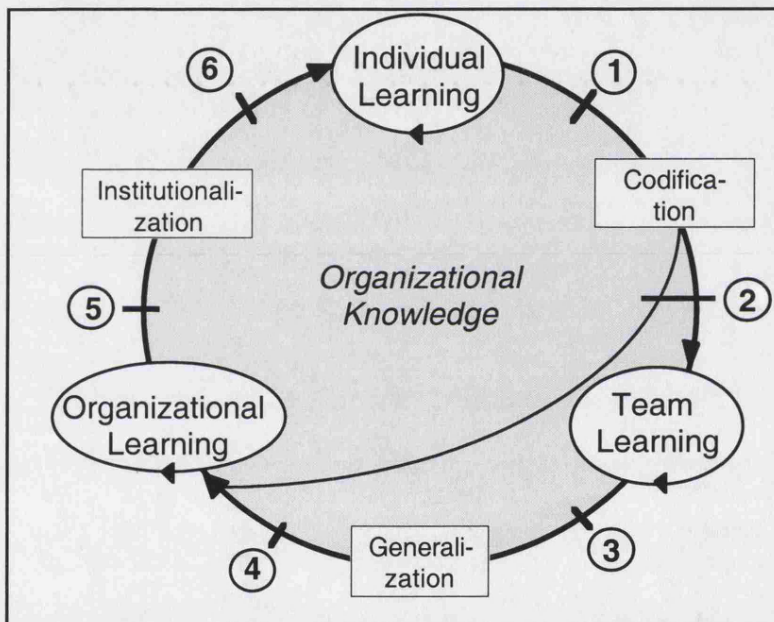
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organization as a whole. This opposition originated mainly from Company III's growth, and the financial success of Company IV neither created obvious need for change learning, i.e. double-loop learning. And finally, regular interruptions between (6) institutionalization and individual learning applied to both suppliers, i.e. Companies III and IV, due to a lack of formal procedures to make institutionalized knowledge easily accessible to everyone.

Figure 9.2: The Incomplete Comprehensive Organizational Learning Cycle



The in-depth interviews showed that, although actual breaks in the comprehensive organizational learning cycle are sometimes more blurred than the six theoretical cuts, this plain model helps to understand reality by reducing the complexity through simplification. Additionally, in the case of Companies III and IV, no organizational learning cycle was started by the top management in the first instance, as they did not appear to learn individually, which leads to the next point.

Fourthly, the commitment of top management plays a major role for the success or failure of the implementation of organizational learning systems as well as for the acquisition of the Learning Organization's



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characteristics. Their existence plays an important backing role in the implementation and running of organizational learning systems. In the first group of companies, both times the change was initiated by the Managing Director. However, whereas in Company I's case the organizational learning cycle was facilitated by approaching Japanese car customers pitching for new business, in Company II's case the organizational learning cycle had to be developed with less Japanese guidance, which was not always a very smooth process. And in Companies III and IV's case the organizational learning cycle was not really started at all by the top management.

Fifthly, the in-depth interviews confirmed the impression that the contact with Japanese companies in the car industry (i.e. car producers and/or component suppliers) is the key for a fast and secure way of acquiring the Learning Organization's characteristics and properly working organizational team learning systems for car component suppliers in Britain. However, the amount of business with suppliers also plays a major role in the decision of Japanese car companies whether or not to invest into teaching of its suppliers. Additionally, the last two suppliers, i.e. Companies III and IV, showed that organizational learning systems tend to be not successful and fade quickly without a sufficient degree of the Learning Organization's characteristics as a backing. In addition, neither of them had received training from a Japanese company in the car industry.

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Sixthly, the two car component suppliers with low values in the characteristics of the Learning Organization had no system installed yet to spread newly developed knowledge around the whole organization. However, the two suppliers with a high degree of the Learning Organization's characteristics had already developed essential parts of a system.

Last but not least, although a company can have a high degree of characteristics of the Learning Organization and an organizational learning system (Company II), it can lose business orders in a highly competitive subsegment of the component industry. Whereas, on the other hand, an organization, which has a low level in the Learning Organization's characteristics and no properly operating organizational learning systems (Company III), can grow and prosper in a favourable subsegment of the industry with little competition.

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The implication is that it is not advisable for future empirical research to link organizational learning capabilities to corporate success, like growth and/or profits, unless the extent of competition in the industrial subsegment or strategic group is also measured (although this still might need the inclusion of various other factors that contribute to corporate success). Analysing only one industry without more in-depth detail would be not precise enough and indeed blur the research efforts. ✓ *correct*

This chapter dealt with the in-depth interviews and their findings, which was the third and final step of the empirical research approach. Qualitative and quantitative research was conducted in order to analyse organizational learning and the Learning Organization in reality.

The next and final chapter concludes this thesis.



## 10. Conclusion

In particular, this research focused on the refining of the understanding of organizational learning and the Learning Organization. Organizational learning was discussed and defined, and its process was demonstrated with the model of the comprehensive organizational learning cycle, which included organizational knowledge. The Learning Organization was researched by defining and analysing its characteristics, learning systems, outcomes and sources, all four of which were operationalized for empirical research in Chapters 7, 8 and 9. This last chapter puts the main findings into perspective.

The chapter starts with its contribution to the currently available body of literature on the Learning Organization and organizational learning, continues with a recapitulation of the approach taken in this thesis. Then, it outlines the limitations of the empirical and theoretical work and, finally, concludes what implications the research results have for management.

### 10.1. Contributions of this Thesis to Existing Literature

The contributions of this thesis to the existing body of literature on organizational learning and the Learning Organizations lie in the synthesis of, and several new insights about, the Learning Organization's characteristics, their outcomes and origins, as well as an improved definition of organizational learning and a new model of a complete organizational learning cycle.

Additionally, compared to the paradigm of lean production, the discussion at the end of Chapter 4 and in Chapter 5 showed that the theory of organizational learning and the Learning Organization, besides similar explanatory power, also offers an underlying coherent theoretical framework with its focus on learning. It can even explain recent developments in the Japanese car industry, which lean production cannot do anymore, due to the conceptual limitations of its paradigm.



## 10. CONCLUSION

### 10.1.1. Contributions Derived from Hypothesis Testing

Firstly, a coherent model of the Learning Organization with its characteristics could be synthesised from the piecemeal models of the existing literature. It was demonstrated that this coherent framework of the ten Learning Organization's characteristics was useful for empirical analysis, in order to understand the role they play in enhancing organizational learning of the Learning Organization.

Secondly, in accordance with the theory developed, by rejecting the first null hypothesis it could be shown that there is a significant impact of the Learning Organization's characteristics on organizational learning outcomes, which has never been researched in this depth before. One important finding was that this impact of the Learning Organization's characteristics on organizational learning outcomes occurs mainly in an indirect way via organizational learning systems as an intermediate variable, and not in a direct way.

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The questionnaire analysis suggested that a successful introduction of continuous improvement team systems was strongly dependent on the degree to which the characteristics of the Learning Organization existed. The in-depth interviews helped to interpret the result of the questionnaire analysis that car component suppliers with a high degree of the Learning Organization's characteristics had introduced continuous improvement team systems and abolished employee suggestion systems, due to the success of the former compared to the failure of the latter.

The implications of this thesis are that individual learning alone can lead to organizational learning, but that team learning plays a pivotal role as a transfer mechanism from individual learning to organizational learning, especially in the case of complex knowledge. Furthermore, organizational learning systems, in the form of employee suggestion systems and especially team improvement systems, play a crucial role in the organizational learning process. Organizational learning systems were neglected in the literature about organizational learning to date.

Thirdly, by rejecting the second null hypothesis it could be demonstrated that relationships of car component suppliers in Britain with Japanese companies in the car industry are important for these suppliers in order to acquire the characteristics of the Learning Organization. The

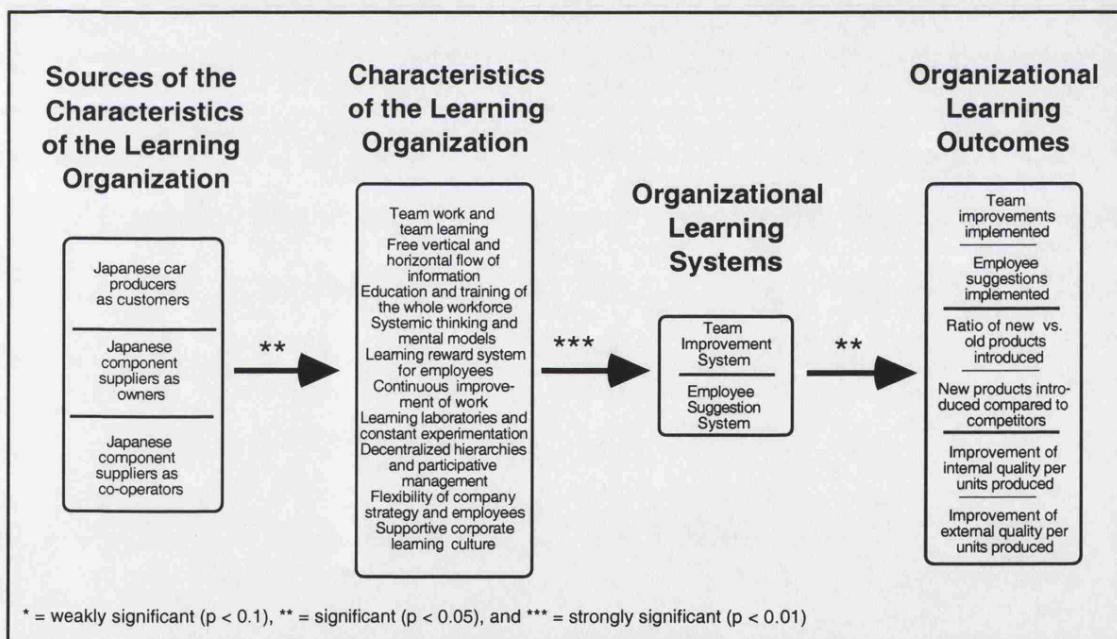
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## 10. CONCLUSION

impact of was highly significant for relationships with Japanese car manufacturers (which were regarded as the source for the Learning Organization's characteristics) as well as Japanese car suppliers as co-operators. The impact was only weakly significant for relationships with Japanese car component suppliers as owners. Thus, the research suggested that for the teaching of the Learning Organization's characteristics, the transfer of implicit, i. e. tacit, knowledge plays a major role. This can only be done properly through regular personal contact in a conducive relationship, i.e. "socializing", e.g., in form of regular engineers visits to provide training or secondment of employees for a longer period.

A summary of the major results of the hypotheses testing with questionnaire data from seventy car component suppliers in Britain is depicted in Figure 10.1 below.

Figure 10.1: Summary of the Major Results of Hypotheses Testing



### 10.1.2. Further Contributions to Existing Literature

Firstly, the working definition of organizational learning (the first two sentences of the definition below), elaborated in Chapter 2, could be



## 10. CONCLUSION

confirmed by the empirical findings of this thesis. In addition, as a further contribution, it was concluded from the empirical research in Chapter 8 and 9 that the intentional use of especially formalized team learning, to solve organizational tasks and improve organizational performance, leads to better results from organizational action. This insight is added to the definition in order to clarify the interactions of the different elements:

*Organizational learning* is a process of knowledge acquisition or knowledge generation of an organization, performed through individuals, which can be accomplished by teams. It is based on organizational memory that is expanded, which can improve organizational actions. The intentional use of organizational learning systems, especially team learning systems, in order to solve organizational tasks and improve performance, has a positive impact on organizational actions and their outcomes.

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Secondly, the model of the *comprehensive organizational learning cycle*, elaborated in Chapter 2, could be corroborated by the impressions gained from the empirical work. The questionnaire analysis in Chapter 8, but also the empirical research of the in-depth interviews in Chapter 9, suggest a dual-phased comprehensive organizational learning cycle, which is structured as follows.

(1) In the primary comprehensive organizational learning cycle, started by the Managing Director (individual learning) and/or top management (team learning) normally on a double-loop level, the organization is focused and structured to accomplish certain goals in a secondary learning cycle.<sup>116</sup> The results of the in-depth interviews suggest that the Managing Director option is more prevalent in starting an organizational cycle by setting a specific goal for the next organizational learning cycle (see the line drawn between “Codification” and “Organizational Learning” at Figure 10.2 below, which is thick now).

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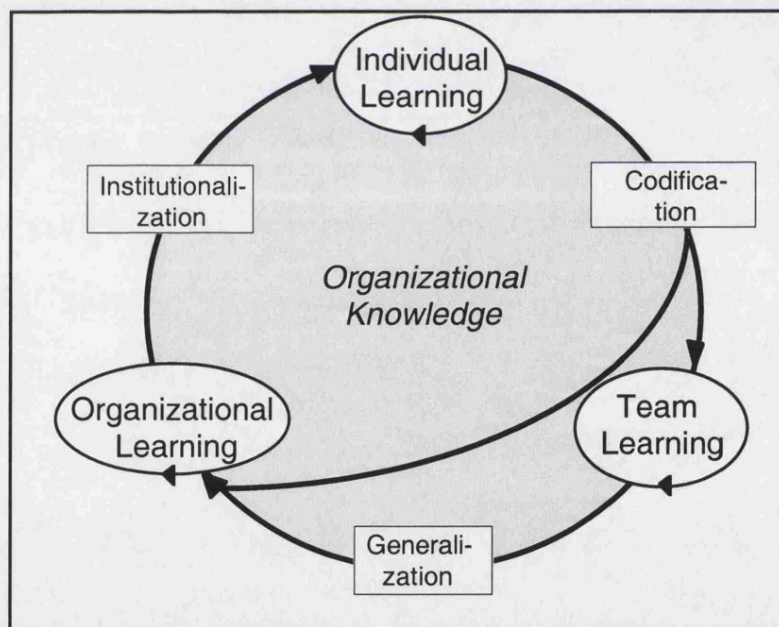
<sup>116</sup> However, should this primary organizational learning cycle be ill reflected, i.e. lack systemic thinking, and not be focused on enabling and fostering organizational learning, the secondary organizational learning cycles are doomed to fail. This occurs normally when the attempt is made to copy a concept without understanding the underling tacit knowledge, which indicates again the importance of socialization.



## 10. CONCLUSION

(2) In the secondary comprehensive organizational learning cycle, which tends to be repetitive, the rest of the organization can strive for these set goals: either predominantly single-loop learning in the case of product or process improvements or predominantly double-loop learning in the case of product or process developments. In both cases, team learning is superior in solving complex problems which involve implicit knowledge from different areas, but also because of the fact that team learning systems work more effectively and efficiently in practice than individual learning systems. This means as well that the need for including team learning into an organizational learning cycle depends on the complexity of the problem. For simple problems, individual learning can be enough on its own and, therefore, more appropriate (a differentiation, which was not really considered in the existing literature to date).

Figure 10.2: The Comprehensive Organizational Learning Cycle



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The implication of these findings about the nature of the dual-phased comprehensive organizational learning cycle is that statements such as that from Senge (1990a: 7) that the “old days when a Henry Ford, Alfred Sloan, or Tom Watson *learned for the organization* are gone”, on the contrary, still hold true today. However, it showed that the primary comprehensive

## 10. CONCLUSION

organizational learning cycles of top management are most effective when they aim to facilitate organizational learning of the rest of the organization in secondary comprehensive organizational learning cycles.

Furthermore, as opposed to their model, presented in Chapter 2, Nonaka & Takeuchi (1995) describe in their case studies a process of the development of a new product<sup>117</sup>, which is also a dual-phased comprehensive organizational learning cycle. The case studies normally start with the action of top manager or top management, which perform the primary organizational learning cycle for the organization, as they perceive the need for the development of a new product and restructure the organization accordingly. Then, a secondary organizational learning cycle is performed, mostly with many learning loops on the individual and team level, when the individuals of a project development team achieve the development of the new product with the help of their team. This also means that these organizational learning cycles for new product development are more a top-team-down approach, than a middle-up-down approach, like that suggested by Nonaka & Takeuchi (1995), implying that the organizational learning cycle is started from middle management. This can be said as well in a light of the in-depth interviews in Chapter 9, which showed that starting the primary comprehensive organizational learning cycle from middle management does not work properly in reality. *poor inter-pretation of N+T*

Incomplete organizational learning cycles within the comprehensive model emerged mainly in the primary cycle. This was because none of the top management had started a comprehensive organizational learning cycle by individual learning. Consequently, the person or relevant group in middle management failed in secondary organizational learning cycle, either around "codification" or around "generalization" (for example, this was the case with the two companies with a low prevalence of the Learning Organization's characteristics in Chapter 9). However, it is not always clear in reality where exactly the break in the organizational learning circle may be, as the comprehensive model might suggest.

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<sup>117</sup> New product development normally requires double-loop learning, in order to change the frame of actions, compared with the improvement of existing products, which normally needs only single-loop learning. The latter is not included in the model portrayed by Nonaka & Takeuchi, although it appears to be more typical to Japanese companies than the development of complete new products. *hmm*



## 10. CONCLUSION

If one applies the model of the comprehensive organizational learning cycle to plants or small companies, this thesis shows that a small organization is often part of at least one larger organization, which again can belong to an even larger organization. How does this fit in with the comprehensive model? The answer is suggested to be that in all cases there are individuals involved as the basic learning unit. However, individual learning, team learning and organizational learning can be found on different levels and in different forms in a large organization. This learning process, which includes the efficient transfer of tacit knowledge (socialization), can have at least six different forms in practice: (1) team/employee suggestion systems, (2) product development teams within the particular division/unit, (3) product development teams with suppliers/customers/partners, (4) meetings of different teams of one corporate division/unit, (5) contact fairs of the different divisions/units of the company or (6) task force teams which visit the different divisions/units of the company. Although the comprehensive organizational learning cycle will look the same, the level of the organization will obviously differ. Also, sharing of knowledge with other organizations constitutes a new comprehensive organizational learning cycle in itself, which normally starts with individual learning of one or more individuals.

huh?

### 10.2. Assessment of the Approach of this Thesis

This thesis has endeavoured to make a contribution to the theory of organizational learning and the Learning Organization by establishing a new framework for the Learning Organization, as an ideal model of an organization which excels in organizational learning. The research approach is explained in more detail below.

After the introduction and discussion of existing theories of organizational learning and the Learning Organization, a synthesised model of the Learning Organization was developed. Furthermore, this thesis identified a current lack of empirical research available in this area. In addition, many weaknesses were found in the few investigations done to date, including a lack of theoretical underpinning, as discussed at the end of Chapter 6. As a consequence, the theoretical framework developed (based on the Learning Organization's characteristics) was operationalized in order to undertake in-depth empirical research in practice. Three areas



## 10. CONCLUSION

were focused on: firstly, the characteristics of the Learning Organization, secondly, the outcomes of organizational learning and, thirdly, the sources of the Learning Organization's characteristics.

### 10.2.1. The Ten Characteristics of the Learning Organization

This thesis' contribution is that the *ten characteristics of the Learning Organization* have not been refined, structured and synthesised to date in such a comprehensive way. Also, to date nobody has shown how conducive these characteristics are for organizational learning.

The ten characteristics of the Learning Organization are displayed in Table 10.1. The shading in which the items appear in the table indicates a ranking. This was not yet the case when the characteristics first were introduced in the middle of Chapter 3. The characteristic "systemic thinking and mental models" is ranked as the most important feature, indicated by a dark shading. The theoretical discussion at the end of Chapter 3 explained the importance of this characteristic as well as the regression analysis in Chapter 8, which established its key importance for an organization to become a Learning Organization.

The characteristic "continuous improvement of work" is regarded as the second most important characteristic, also being necessary and sufficient, due to its pivotal role to continuously challenge and improve the status quo in an organization, as has been elaborated in Chapter 3. However, it did not show a significant difference in importance in the empirical analysis compared to the other eight characteristics of the Learning Organization in Chapter 8. As a consequence, "continuous improvement of work" is only shown in a light shading in Table 10.1.

It is hardly possible to rank the succeeding eight characteristics in importance, all of which have been suggested to be necessary but not sufficient<sup>118</sup> in Chapter 3. But, the "supportive organizational learning culture" stands out for two reasons. Firstly, it is constructed from a group of six elements itself and, secondly, it has an all embracing and nurturing role. This is why this characteristic has been given a light shading.

<sup>118</sup> This means that these characteristics alone are not enough to create a Learning Organization.

## 10. CONCLUSION

The characteristics “free vertical and horizontal flow of information” is also worth mentioning, as Chapters 8 and 9 showed that content of information plays a much more important role than the form in which this information is distributed. However, there was no indication that it was more important than the other six remaining characteristics of the Learning Organization. This is why all seven remaining characteristics are classified as being necessary but not sufficient and, therefore, have not been shaded at all in Table 10.1.

Table 10.1: The Ten Characteristics of the Learning Organization

• Systemic thinking and mental models
• Continuous improvement of work
• Supportive corporate learning culture*
• Team work and team learning
• Free vertical and horizontal flow of information
• Education and training of the whole workforce
• Learning reward systems for employees
• Flexibility of company strategy and employees
• Decentralized hierarchies and participative management
• Learning laboratories and constant experimentation
* includes: dialogue, shared interpretation of reality, shared vision of the future, openness & trust, commitment & tolerance and risk taking & responsibility

Note: The darker the shading the higher the ranking of the characteristic.

The more prevalent these ten characteristics of the Learning Organization were in a company’s questionnaire, the closer it reflected the ideal of the Learning Organization. It was hypothesised that this would lead to better organizational learning outcomes, which are dealt with next.



## 10. CONCLUSION

### 10.2.2. The Six Measures for Organizational Learning Outcomes

This thesis developed six measures of organizational learning outcomes, in order to gauge the extent of organizational learning outcomes of an organization empirically. The existing literature could not provide any useful operationalized measures for this research.

The six measures of organizational learning outcomes were divided into the following three different groups with two scales each.

The first group, which gauged the amount of individual learning which had turned into organizational learning, consisted of the (a) number of implemented team improvements and the (b) number of implemented suggestions per employee.

The second group, which assessed the speed of organizational learning<sup>119</sup>, included the (c) ratio of new products introduced compared to existing ones and the (d) self-assessment of new products introduced compared to competitors.

The third group, which measured the extent of improvements in quality, comprised (e) improvement of internal quality per units produced and (f) improvement of external quality per units produced. The latter refers to the improvement of rejects or recalls of products by customers.

Besides these organizational learning outcomes, there was also a focus on the sources of the characteristics of the Learning Organization.

### 10.2.3. The Sources of the Learning Organization's Characteristics

The argument advanced in this thesis that the theory of the Learning Organization is a coherent theoretical model was based on the concept of organizational learning. It proved to be a useful tool to help explain the global market success of Japanese companies.

As, since the early 1990's, direct car component suppliers in Great Britain have been and are strongly exposed to the impact of Japanese companies in the car industry, these suppliers were selected as the subject

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<sup>119</sup> This could range from product development of completely new products to product improvements, whereas the rest of the groups of outcomes only measured product or process improvements.



## 10. CONCLUSION

*if so UK wasn't  
well tested*

of research. The sources of the characteristics of the Learning Organization were hypothesised to be mainly Japanese car producers as Learning Organizations in their own right. Therefore, the diffusion of characteristics of the Learning Organization to car component suppliers in Great Britain was explored.

### 10.2.4. The Two Main Hypotheses and the Research Methods

The overall research focused on two main hypotheses, which findings were recaptured at the beginning of this chapter. The first hypothesis put forward a positive impact of the Learning Organization's characteristics on organizational learning outcomes (intra-organizational learning). The second hypothesis proposed that these Learning Organization's characteristics were predominantly due to some form of relationship with Japanese car producing or Japanese component supplying companies (inter-organizational learning).

Hypothesis 1 tested whether car component suppliers in Britain which showed a higher score in the characteristics of the Learning Organization tend to perform better in organizational learning outcomes.

Hypothesis 2 analysed the source of the Learning Organization's characteristics and tested whether component suppliers in Britain which had more contact with Japanese companies in the car industry tend to have more characteristics distinctive of the Learning Organization.

The empirical part of this thesis used a combination of three different research methods.

Firstly, exploratory interviews were conducted with six car component suppliers in Britain to test the general approach of this thesis and refine the hypotheses. Secondly, completed questionnaires from seventy suppliers were examined to test the hypotheses empirically. And, thirdly, in-depth interviews with four selected companies were conducted at the end in order to support the findings and to confirm the interpretations from the questionnaire survey, as well as to investigate the process of organizational learning over time.

As previously argued in Chapter 6, in case of contradictory results between the different research methods employed, this thesis rather followed the phenomenological approach (i.e. focusing on meanings) than

## 10. CONCLUSION

the positivist approach (i.e. focusing on facts). This is because the world is not seen as being external and objective, but rather as being socially constructed and subjective.

poor philosophy

### 10.3. Limitations of the Contributions of this Thesis

The limitations of the research pursued in this thesis, some of which can also be areas for future research, are as set out below.

Firstly, the sample size of the seventy questionnaires, in combination with certain unanswered questions by some recipients, led to a low number of valid cases with respect to a few items in this research. However, one could nevertheless argue that a clear picture still emerges in the analysis carried out by this thesis, due to the research combination of a questionnaire survey and the conducting of interviews.

Secondly, most car component suppliers did not complete the sections in the questionnaire relating to Japanese suppliers as customers, as suppliers or as co-members of supplier associations (which can include competitors). Therefore, the analysis of these sources was dropped when the questionnaire data was evaluated. However, the theoretical argument as well as the interviews suggested that they can all play a role in the process of acquiring the Learning Organization's characteristics.

Thirdly, the questionnaire with its cross-sectional nature had some disadvantages compared to a longitudinal study, especially when looking at the empirical causal relationships. For the research of this thesis, as explained in Chapter 6, a cross-sectional study approach was chosen. Some of its deficiencies were offset with the help of exploratory and in-depth interviews, both confirming the assumed causal relationships. Still, a longitudinal study could be an interesting field for future research, for example, about the learning process between direct car component suppliers and their suppliers, or perhaps set in a different industry context.

Fourthly, the questionnaire sample can be seen as being representative for the population of car component producers in Britain that directly supply car manufacturers with respect to turnover and employees. Testing of further values for representativeness (like e.g., type of component) was not possible due to a lack of data available. However, the actual population



## 10. CONCLUSION

was not of major concern for the purpose of this research, which was more aimed at the empirical testing of a newly-designed theoretical model.

Last, but not least, there are also some implications of this research for senior management.

### 10.4. Implications of this Thesis for Senior Management

The key question for senior management certainly is: what is the advantage of being a Learning Organization? Generally speaking, it enables the organization to stay competitive by steadily improving its performance and solving problems quickly. The structure of a Learning Organization also helps to anticipate, and, therefore, avoid crises. This is enabled through the ability to acquire or generate explicit and especially tacit knowledge at a high pace and turn it quickly into tangible outcomes. The main reason for this is, on the one hand, the close team-based contact between the employees, who learn for their organization as they see that their contribution counts and is rewarded. On the other hand, there is also the close-team-based contact with clients, which keeps the company in touch with customer needs, which can sometimes change quickly.

The following recommendations for senior management can be concluded from this thesis as regards car components suppliers in Britain, who want to increase the competitiveness of their companies. This can be achieved by striving towards the ideal model of the Learning Organization in order to achieve a high performance in organizational learning outcomes. Whereas top management have the advantage to act as they wish, middle management has the more difficult task of convincing top management to act so.

The research presented in Chapters 7, 8 and 9 showed that the best way, because it is the most direct one, to acquire the characteristics of the Learning Organization is to gain or to have Japanese customers. The questionnaire analysis suggests a strong preference for Toyota or Nissan compared to Honda. As explained in Chapter 8, Honda, as a late-comer to the automotive industry in Japan, did not have to learn how to teach its suppliers, which were already trained by Toyota or Nissan. However, in order to offset this deficiency in Britain, Honda tends to facilitate co-

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*un-*  
*convincing*



## 10. CONCLUSION

*I agree learning is important, but not for "LOS" + anything else shown*

operation with Japanese suppliers, a fact to be taken into consideration when doing business with Honda. In any case, the quantity of business should be large enough to give these Japanese customers sufficient self-interest to train their supplier.

The second best alternative is to seek for Japanese suppliers as co-operators, in the form of joint-ventures, technical assistance/ collaboration agreements or design/technical co-operations to improve quality. The third best alternative is to have a Japanese company as an owner, but this has a much weaker impact than the first two options.

There is also the option of acquiring the Learning Organization's characteristics by a trial and error process, without the help of socializing, i.e. close personal contact, with the kind of Japanese companies mentioned above. However, this conversion process, which tries to convert explicit knowledge into implicit knowledge, is much more onerous and takes much longer. Additionally, the research showed that this "do-it-yourself" approach can lead to organizational learning of the wrong explicit knowledge about the Learning Organization's characteristics, which is neither conducive to improving organizational learning nor organizational learning outcomes of the organization.

Although the questionnaire-based research could not give any indication about learning from Japanese supplier companies as customers, suppliers or as co-members in supplier associations, the interviews suggested that this can be the case. Furthermore, there was little significant evidence to be found in this work which suggested that European or American companies, either as customers or owners, were a source for the Learning Organization's characteristics for component suppliers in Britain.

*hardly any - to or the free*

In addition to the characteristics of the Learning Organization, an organizational learning system, preferably in the form of a team improvement system, with responsibility and power for its teams in combination with a co-ordinator, is the most important tool to transfer individual knowledge into organizational knowledge. This enables a company to become a high performer in organizational learning, and, therefore, outcomes, i.e. number of improvements implemented, speed of product developments and improvements in quality.

As regards the speed of product development (measured by the two variables (c) ratio of new products introduced compared to existing ones

## 10. CONCLUSION

and (d) new products introduced compared to competitors), only the use of project teams (assessed by the characteristic “team work and team learning”) had a direct positive impact on both. This was especially the case for inter-organizational project teams with customers or suppliers, but also partially for combined intra-organizational cross-departmental and hierarchical project teams.

The in-depth interviews highlighted the fact that an organization with a low score of the Learning Organization’s characteristics in a favourable subsegment of the industry with little competition, can nevertheless grow strongly or make good profits, and be successful. However, as previously mentioned in this thesis, there is a general trend of increasing competition for all car component suppliers, which has been fuelled especially by global sourcing and single sourcing (i.e. only one supplier for one part), as well as increased competition among car assemblers. This makes the option of striving for the ideal of the Learning Organization attractive for component suppliers, even if some few areas in the car component industry are currently still relatively safe from cut-throat competition.

The questionnaire analysis and the in-depth interviews highlighted the fact that the successful change towards the Learning Organization is very dependent on the backing of top management. If they did not perceive any need or pressure to change, then it was very difficult for the organization to change at all. The in-depth interviews in Chapter 9 also suggested that the role of top management, especially the Managing Director, play a significant role for the acquisition of the Learning Organization’s characteristics, like the multiple regression at the end of Chapter 8 proposes. On the one hand, the regression analysis showed only a weakly significant impact of top management’s receptivity, on the other hand, this was the only other significant variable besides Japanese car companies, which showed a highly significant impact. In other words, the backing of top management can make or break the acquisition of the Learning Organization’s characteristics, which again are needed for the successful implementation and performance of organizational team learning systems.

In transforming an organization towards the ideal of the Learning Organization, the characteristic “systemic thinking and mental models” plays a major role, as confirmed by the logistic regression analysis. Also the interviews with those companies which had a high degree of

## 10. CONCLUSION

characteristics of the Learning Organization showed that “systemic thinking and mental models”, especially of top management, plays a decisive role in this transformation process. The organization-wide implementation of the ideas gained from this characteristic is very important.

The question remains: is there a specific management style for directing an organization towards the Learning Organization? The conclusion of this work is that this management style is flexible and receptive in view of the characteristics of the Learning Organization, especially of “systemic thinking and mental models”, and it focuses on contributing to organizational learning outcomes. Doing so helps senior management to decide which areas are critical for the completion of comprehensive organizational learning cycles, in order to structure the organization accordingly and to make organizational learning happen on a continuous basis - not just by chance.

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## APPENDIX

### **APPENDIX:**

1. Questionnaire for Suppliers
2. Questionnaire Guideline for Exploratory Interviews (General Example)
3. Questionnaire Guideline for In-depth Interviews (General Example)
4. Skill Levels for I, L, U Skill Matrix (Source: Company B)



The London  
School of  
Economics

# Questionnaire for Suppliers

Please complete the questionnaire and return it to:  
(the address can be used for a window envelope)

Mr Philipp Rosengarten  
London School of Economics  
Industrial Relations Department  
Houghton Street  
London WC2A 2AE

**Confidentiality:** Your data will be used only for research at the LSE by Philipp Rosengarten. Company names will not be mentioned in any form in the analysis or presentation of the data. For any further questions, please call Philipp Rosengarten: 0171-955 7917 or 0171-834 0587

Please note: If your company involves more than one factory, please refer only to the **factory at your site** when answering the questions.

**I. Team Work:** (employees working together in a team/group)

1. General questions about shopfloor teamwork used for production:

- Do you use a shopfloor team structure for production? ☐ No ☐ Yes, since 19 \_\_.
- How many people does a shopfloor team normally consist of ? \_\_\_\_ people
- Do these teams form a larger group for information exchange?  
☐ No ☐ Yes If yes, how many teams form a larger group? \_\_\_\_ teams
- Do shopfloor teams meet to discuss improvements?  
☐ No ☐ Yes, \_\_\_\_ times a month for \_\_\_\_ minutes on average.
- Do shopfloor team members rotate between jobs regularly?  
☐ No ☐ Yes, every \_\_\_\_ hour(s) during their shift.

2. In 1994, how many types of mixed project teams existed in total consisting of employees from different . . .
- a) departments: \_\_\_\_ teams
  - b) levels of hierarchy: \_\_\_\_ teams
  - c) departments and levels of h.: \_\_\_\_ teams

3. In 1994, how many mixed project teams existed in total consisting of your own employees and employees from your . . .
- a) customers: \_\_\_\_ teams
  - b) suppliers: \_\_\_\_ teams
  - c) partner companies: \_\_\_\_ teams

4. In which year did you start to employ mixed project teams? In 19 \_\_.

**II. Information and Communication:**

1. General questions about information and communication in your company:

- What kind of communication channels do you use in your company?
  - a) briefings ☐ No ☐ Yes, \_\_\_\_ times a month for \_\_\_\_ minutes.
  - b) meetings with representatives of employees  
☐ No ☐ Yes, \_\_\_\_ times a month for \_\_\_\_ minutes.  
Are these representatives unions? ☐ No ☐ Yes
  - c) newsletters ☐ No ☐ Yes, every \_\_\_\_ week(s).
  - d) others \_\_\_\_\_



- What kind of information do you disclose to all employees in your company?

- |                             |  |
|-----------------------------|--|
| a) Financial performance    | <input type="radio"/> No <input type="radio"/> Yes, since 19 __. |
| b) Quality performance      | <input type="radio"/> No <input type="radio"/> Yes, since 19 __. |
| c) Productivity performance | <input type="radio"/> No <input type="radio"/> Yes, since 19 __. |
| d) Production plans         | <input type="radio"/> No <input type="radio"/> Yes, since 19 __. |
| e) Investment plans         | <input type="radio"/> No <input type="radio"/> Yes, since 19 __. |

2. Do the following statements describe the role of information within your company?

- |   | not at all | partially | very much |   |   |
|---|------------|-----------|-----------|---|---|
| - 'Information exchange occurs across and between. . .      | ①          | ②         | ③         | ④ | ⑤ |
| a) different departments.'                                  | ①          | ②         | ③         | ④ | ⑤ |
| b) different levels of hierarchy.'                          | ①          | ②         | ③         | ④ | ⑤ |
| - 'Information concerning work is shared by all employees.' | ①          | ②         | ③         | ④ | ⑤ |
| - 'All employees communicate with each other informally.'   | ①          | ②         | ③         | ④ | ⑤ |
| - 'Face-to-face communication is the most usual way.'       | ①          | ②         | ③         | ④ | ⑤ |
| - 'Communication flows from. . .                            | ①          | ②         | ③         | ④ | ⑤ |
| a) top to bottom'   | ①          | ②         | ③         | ④ | ⑤ |
| b) bottom to top.'  | ①          | ②         | ③         | ④ | ⑤ |

### III. Education and Training:

1. General questions about education and training:

- What percentage of sales was spent on education and training in 1994? \_\_ %
- The latest major restructuring of the education & training programme was in 19 \_\_.
- How many different courses do you offer shopfloor workers? \_\_\_\_
- Do you design these courses in-house to suit your needs? ☐ No ☐ Yes
- Do you use T.W.I. (Training Within Industries) as a design platform for your in-house training courses? ☐ No ☐ Yes ☐ Don't know

2. Do these statements describe education and training provided in your company?

- |  | not at all | partially | very much |   |   |
|--|------------|-----------|-----------|---|---|
| - 'Education and training is carried out systematically.'        | ①          | ②         | ③         | ④ | ⑤ |
| - 'Education and training is done . . .                          | ①          | ②         | ③         | ④ | ⑤ |
| a) at all levels.'   | ①          | ②         | ③         | ④ | ⑤ |
| b) in all functions.'  | ①          | ②         | ③         | ④ | ⑤ |
| - 'Education and training is provided on the shopfloor for . . . |            |           |           |   |   |
| a) workers in . . .  |            |           |           |   |   |
| aa) statistical techniques.'                                     | ①          | ②         | ③         | ④ | ⑤ |
| ab) graphical techniques.'                                       | ①          | ②         | ③         | ④ | ⑤ |
| ac) creativity techniques.'                                      | ①          | ②         | ③         | ④ | ⑤ |
| ad) communication skills.'                                       | ①          | ②         | ③         | ④ | ⑤ |
| ae) presentation skills.'  | ①          | ②         | ③         | ④ | ⑤ |
| b) team leaders in . . .   |            |           |           |   |   |
| ba) statistical techniques.'                                     | ①          | ②         | ③         | ④ | ⑤ |
| bb) graphical techniques.'                                       | ①          | ②         | ③         | ④ | ⑤ |
| bc) creativity techniques.'                                      | ①          | ②         | ③         | ④ | ⑤ |
| bd) communication skills.'                                       | ①          | ②         | ③         | ④ | ⑤ |
| be) presentation skills.'  | ①          | ②         | ③         | ④ | ⑤ |

## V. Problem Solving and Opinions

1. Do the following statements describe how your employees solve problems?

- |  | not at all | partially | very much |   |   |
|--|------------|-----------|-----------|---|---|
| - 'In taking problem solving actions employees consider. . . | ①          | ②         | ③         | ④ | ⑤ |
| a) likely reactions to their actions.'                       | ①          | ②         | ③         | ④ | ⑤ |
| b) delay of reactions to their actions.'                     | ①          | ②         | ③         | ④ | ⑤ |
| - 'Problems are traced back to their root causes.'           | ①          | ②         | ③         | ④ | ⑤ |
| - 'Emphasis is placed on the context of problems.'           | ①          | ②         | ③         | ④ | ⑤ |
| - 'Short-term solutions are normally avoided.'               | ①          | ②         | ③         | ④ | ⑤ |
| - 'Personal opinions are expressed to . . .                  | ①          | ②         | ③         | ④ | ⑤ |
| a) colleagues.'  | ①          | ②         | ③         | ④ | ⑤ |
| b) superiors.'   | ①          | ②         | ③         | ④ | ⑤ |
| - 'Different opinions are accommodated by consensus.'        | ①          | ②         | ③         | ④ | ⑤ |

2. The last major change in your company's problem solving approach began in 19 \_\_\_\_.

## V. Reward System: (note: payment is considered only a part of the reward system)

1. Do these statements below describe the reward system within your company?

- |   | not at all | partially | very much |   |   |
|---|------------|-----------|-----------|---|---|
| - 'Only non-financial rewards are given for acquired skills.' | ①          | ②         | ③         | ④ | ⑤ |
| - 'Our reward system for shopfloor workers is based on . . .  | ①          | ②         | ③         | ④ | ⑤ |
| non-monetary rewards.'  | ①          | ②         | ③         | ④ | ⑤ |
| - 'Punishment for failures is generally avoided.'             | ①          | ②         | ③         | ④ | ⑤ |
| - 'Our reward system for employees is long-term oriented.'    | ①          | ②         | ③         | ④ | ⑤ |
| - 'Our reward system values the . . .                         | ①          | ②         | ③         | ④ | ⑤ |
| a) outcome of learning activities'                            | ①          | ②         | ③         | ④ | ⑤ |
| b) outcome of experimentation.'                               | ①          | ②         | ③         | ④ | ⑤ |

2. Please give examples of non-monetary rewards your company uses: \_\_\_\_\_

3. The last major restructuring of your reward system for employees began in 19 \_\_\_\_.

## VI. Continuous Improvement:

1. General questions about continuous improvement projects performed by project teams (or groups) of employees in your company: (➡ Go to part 2.)

- Do you employ continuous improvement project teams? ☐ No ☐ Yes, since 19 \_\_\_\_.
- How many continuous improvement team projects did you implement?  
in 1990: \_\_\_\_ in 1992: \_\_\_\_ in 1994: \_\_\_\_ ☐ Not counted.
- How much were the estimated savings by these continuous improvement projects?  
in 1990: \_\_\_\_ £ in 1992: \_\_\_\_ £ in 1994: \_\_\_\_ £ ☐ Not counted.
- Is there a co-ordinator of these continuous improvement project teams?  
☐ No ☐ Yes, he/she does it ☐ a) full-time or ☐ b) in addition to his/her job.

1. General questions about continuous improvement by employee suggestion system:

- Has your company installed an employee suggestion system?  
☐ No (⇒ Go to part 3.) ☐ Yes, the latest version was introduced in 19 \_\_\_\_.
- How many employee suggestions for continuous improvement were generated?  
in 1990: \_\_\_\_ in 1992: \_\_\_\_ in 1994: \_\_\_\_ ☐ Not counted.
- What percentage of all these suggestions was implemented?  
in 1990: \_\_\_\_ % in 1992: \_\_\_\_ % in 1994: \_\_\_\_ % ☐ Not counted.
- How many days on average did the implementation of a suggestion take?  
in 1990: \_\_\_\_ in 1992: \_\_\_\_ in 1994: \_\_\_\_ ☐ Not counted.
- How much money was saved per suggestion on average?  
in 1990: \_\_\_\_ £ in 1992: \_\_\_\_ £ in 1994: \_\_\_\_ £ ☐ Not counted.

3. Do these statements describe continuous improvement within your company?

- |  | not at all | partially | very much |
|--|------------|-----------|-----------|
| - 'Continuous improvement occurs for ...                     |            |           |           |
| a) work flow.'   | ①—②—③—④—⑤  |           |           |
| b) products.'  | ①—②—③—④—⑤  |           |           |
| c) services.'  | ①—②—③—④—⑤  |           |           |
| d) security.'  | ①—②—③—④—⑤  |           |           |
| - 'Continuous improvement is performed using ...             |            |           |           |
| a) statistical techniques.'                                  | ①—②—③—④—⑤  |           |           |
| b) graphical techniques.'                                    | ①—②—③—④—⑤  |           |           |
| c) creativity techniques.'                                   | ①—②—③—④—⑤  |           |           |
| d) communication methods.'                                   | ①—②—③—④—⑤  |           |           |
| e) presentation methods.'                                    | ①—②—③—④—⑤  |           |           |
| - 'Continuous improvement is based on accurate analysis.'    | ①—②—③—④—⑤  |           |           |
| - 'Everyone is involved in continuous improvement.'          | ①—②—③—④—⑤  |           |           |
| - 'Procedures for improvements are detailed & standardised.' | ①—②—③—④—⑤  |           |           |

**VII. Experimenting:** (experiment = test or trial carried out carefully in order to study the results, gain new knowledge and insights, and create something new)

1. Do the following statements describe experimenting within your company?

- |   | not at all | partially | very much |
|---|------------|-----------|-----------|
| - 'Employees experiment ... a) using computer simulations.'   | ①—②—③—④—⑤  |           |           |
| b) using exercises in teams.'   | ①—②—③—④—⑤  |           |           |
| c) in small independent units.'   | ①—②—③—④—⑤  |           |           |
| - 'Employees experiment by systematically ...   |            |           |           |
| a) searching for new knowledge.'  | ①—②—③—④—⑤  |           |           |
| b) testing of new knowledge.'   | ①—②—③—④—⑤  |           |           |
| - 'Experimenting is not only the task of the R & D people.'   | ①—②—③—④—⑤  |           |           |
| - 'When we introduce new machines we test one first.'   | ①—②—③—④—⑤  |           |           |
| - 'Mistakes due to experimenting cannot be avoided.'  | ①—②—③—④—⑤  |           |           |
| - 'We use product development teams with employees from different departments and levels of hierarchy.' | ①—②—③—④—⑤  |           |           |

2. Your last major change relating to experimentation in your company was in 19 \_\_\_\_.



## VIII. Hierarchies and Management:

### 1. Do these statements describe management within your company?

- |  | not at all | partially | very much |
|--|------------|-----------|-----------|
| - 'The company's long-term decisions are discussed among ...                   | ①—②—③—④—⑤  |           |           |
| a) top management.'  | ①—②—③—④—⑤  |           |           |
| b) middle management.'   | ①—②—③—④—⑤  |           |           |
| c) other employees.'   | ①—②—③—④—⑤  |           |           |
| - 'Decisions are made with the involvement of the employees affected by them.' | ①—②—③—④—⑤  |           |           |
| - 'Decisions are delegated to the people who take action.'                     | ①—②—③—④—⑤  |           |           |
| - 'All sections of the company are guided by ...                               |            |           |           |
| a) shared visions.'  | ①—②—③—④—⑤  |           |           |
| b) shared values.'   | ①—②—③—④—⑤  |           |           |
| - 'The company's top management is responsible for ...                         |            |           |           |
| a) understanding the organisation as a system.'                                | ①—②—③—④—⑤  |           |           |
| b) the structuring of learning processes.'                                     | ①—②—③—④—⑤  |           |           |
| c) creating the company's shared vision.'                                      | ①—②—③—④—⑤  |           |           |
| d) anticipating long-term issues.'   | ①—②—③—④—⑤  |           |           |

### 2. The last major change of your company's employment hierarchy began in 19 \_\_.

## IX. Flexibility:

### 1. Do these statements describe attitudes within your company?

- |   | not at all | partially | very much |
|---|------------|-----------|-----------|
| - 'Top management plans company strategies taking into consideration different scenarios.'      | ①—②—③—④—⑤  |           |           |
| - 'Top management tries to anticipate all future developments which might concern the company.' | ①—②—③—④—⑤  |           |           |
| - 'Top management's strategic planning reflects continuously changes in reality.'               | ①—②—③—④—⑤  |           |           |
| - 'White-collar workers are rotated ...   |            |           |           |
| a) within the same department.'   | ①—②—③—④—⑤  |           |           |
| b) between different departments.'  | ①—②—③—④—⑤  |           |           |
| c) between different sections.'   | ①—②—③—④—⑤  |           |           |
| - 'Shopfloor workers, who have been with your company for at least two years, ...               |            |           |           |
| a) have been trained in all jobs of their production team.'                                     | ①—②—③—④—⑤  |           |           |
| b) can perform all jobs of their production team.'  | ①—②—③—④—⑤  |           |           |

### 2. The last major change programme related to company flexibility started in 19 \_\_.

## X. Corporate Culture:

1. Do these statements below describe the corporate culture within your company?

- |  | not at all | partially | very much |
|--|------------|-----------|-----------|
| - 'We use communication techniques that help employees . . . |            |           |           |
| a) recognise their differences in opinion.'                  | ①—②—③—④—⑤  |           |           |
| b) put aside their differences in opinion.'                  | ①—②—③—④—⑤  |           |           |
| - 'Important discussions are guided by facilitators.'        | ①—②—③—④—⑤  |           |           |
| - 'Employees discuss their personal understanding of the     |            |           |           |
| company's reality with other employees.'                     | ①—②—③—④—⑤  |           |           |
| - 'Personal understandings are harmonised by consensus.'     | ①—②—③—④—⑤  |           |           |
| - 'Employees discuss their personal vision about             |            |           |           |
| the company's future with other employees.'                  | ①—②—③—④—⑤  |           |           |
| - 'Personal visions are harmonised by consensus.'            | ①—②—③—④—⑤  |           |           |
| - 'Employees express opinions openly . . .                   |            |           |           |
| a) to peers.'  | ①—②—③—④—⑤  |           |           |
| b) to superiors.'  | ①—②—③—④—⑤  |           |           |
| - 'Employees have confidence in their . . .                  |            |           |           |
| a) peers.'   | ①—②—③—④—⑤  |           |           |
| b) superiors.'   | ①—②—③—④—⑤  |           |           |
| - 'Employees are highly committed to the company.'           | ①—②—③—④—⑤  |           |           |
| - 'Employees have a high tolerance of other's opinions .'    | ①—②—③—④—⑤  |           |           |
| - 'Everyone in the company takes risks sometimes.'           | ①—②—③—④—⑤  |           |           |
| - 'Everyone is responsible for the outcomes of his actions.' | ①—②—③—④—⑤  |           |           |

2. The last major change programme for your company's culture began in 19 \_\_.

## XI. Organisational Change:

1. Have major change programmes taken place in your company since 1980?  
(e.g. Total Quality Initiative, Continuous Improvement Programme, etc.)

☐ No ☐ Yes 1st change 19 \_\_ 2nd change 19 \_\_ 3rd change 19 \_\_

(→ Go to part 3.)

2. What were the reasons\* for and objectives of these change programmes?

(\*e.g. change in ownership, top management, market conditions, competitors, customers, etc.)

- 1st change: \_\_\_\_\_

- 2nd change: \_\_\_\_\_

- 3rd change: \_\_\_\_\_

3. Do these statements describe your company's resources available for change?

- |  | not at all | partially | very much |
|--|------------|-----------|-----------|
| - 'Change programmes are not restricted by our resources.' | ①—②—③—④—⑤  |           |           |
| - 'We have employees who implement change programmes.'     | ①—②—③—④—⑤  |           |           |
| - 'We employ consultants to facilitate change programmes.' | ①—②—③—④—⑤  |           |           |
| - 'We are receptive to new developments at the . . .       |            |           |           |
| a) top management level.'                                  | ①—②—③—④—⑤  |           |           |
| b) middle management level.'                               | ①—②—③—④—⑤  |           |           |
| c) employee level.'  | ①—②—③—④—⑤  |           |           |

## II. Company Data:

1. Name of company: \_\_\_\_\_ founded in 19 \_\_
2. Your name & title: \_\_\_\_\_ ☎ : \_\_\_\_\_
3. Number of employees:  
in 1990: \_\_\_\_\_ in 1992: \_\_\_\_\_ in 1994: \_\_\_\_\_
4. Sales turnover (in million pounds):  
in 1990: \_\_\_\_\_ £ in 1992: \_\_\_\_\_ £ in 1994: \_\_\_\_\_ £
5. What percentage was the share of car components in terms of sales in 1994? \_\_ %
6. How many different sites are owned by your company? \_\_ site(s)
7. You supply ☐ car assemblers direct and/or ☐ component suppliers that do so.
8. Is your company partially or wholly owned by one or more companies?  
☐ No ☐ Yes If yes, what is their a) name, b) country of origin, and c) entry year?  
1) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_  
2) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_  
3) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
9. Since the acquisition, how many of the management/employees d) of the owners worked at your company on a long-term basis or for projects and e) of your company worked at the owners' company or were trained by the owners?  
1) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_  
2) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_  
3) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_

## XIII. Products:

1. Your best selling product in terms of sales turnover . . .  
a) represented what percentage of your sales turnover in 1994? \_\_ %.  
b) consists of how many parts? \_\_ parts. very low medium very high  
c) has a complexity you would rank as ① — ② — ③ — ④ — ⑤
2. What percentage of your products in the market are newer than . . .  
a) one year? \_\_ %. b) two years? \_\_ %. c) four years? \_\_ %.
3. At what stage does your company introduce new products compared to direct competitors?  
a bit same a bit  
later later time earlier earlier  
① — ② — ③ — ④ — ⑤
4. How was your overall product quality in terms of . . .  
(note: - a 'unit' can be a part, a square metre, etc.; example: 4 u.p. 1.000 (u.p. = units per)  
- if you do not measure your quality, please indicate with 'N/M' (= not measured))  
a) first-pass yield (= number of units (specify: \_\_\_\_\_) which did not pass through the production process without being scrapped or reworked)  
in 1990: \_\_ u.p. \_\_\_\_\_ in 1992: \_\_ u.p. \_\_\_\_\_ in 1994: \_\_ u.p. \_\_\_\_\_  
b) units shipped to customers which were rejected or recalled  
in 1990: \_\_ u.p. \_\_\_\_\_ in 1992: \_\_ u.p. \_\_\_\_\_ in 1994: \_\_ u.p. \_\_\_\_\_



4. How many units did your company produce?  
in 1990: \_\_\_\_\_ units      in 1992: \_\_\_\_\_ units      in 1994: \_\_\_\_\_ units
5. Have major machinery investments begun operating since 1990?  
☐ No   ☐ Yes   If yes, how high was the share in terms of sales turnover?  
in 1990: \_\_\_\_\_ £    in 1992: \_\_\_\_\_ £    in 1994: \_\_\_\_\_ £
7. How high was your value-added (= sales turnover - cost of goods bought)?  
in 1990: \_\_\_\_\_ £    in 1992: \_\_\_\_\_ £    in 1994: \_\_\_\_\_ £
8. How high was your capacity utilisation (in percentage)?  
in 1990: \_\_\_\_\_ %      in 1992: \_\_\_\_\_ %      in 1994: \_\_\_\_\_ %
9. How high was your overtime of the workforce (in percentage)?  
in 1990: \_\_\_\_\_ %      in 1992: \_\_\_\_\_ %      in 1994: \_\_\_\_\_ %

#### XIV. Customers:

1. Car assemblers as your customers: What is their a) name, b) country of location, and c) in which year did the relationship begin?
- 1) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 2) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 3) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 4) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 5) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- Since that year, your company d) had how many visits of their improvement teams/specialists and how many of their employees worked at your company, e) had how many of your employees worked at their company and how many of your managers/employees were trained by them?
- 1) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 2) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 3) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 4) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 5) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
2. Car components and materials suppliers as your customers: What is their a) name, b) country of location, and c) in which year did the relationship begin?
- 1) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 2) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 3) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- 4) a) name: \_\_\_\_\_ b) country: \_\_\_\_\_ c) year: 19 \_\_
- Since that year, your company d) had how many visits of their improvement teams/specialists and how many of their employees worked at your company, e) had how many of your employees worked at their company and how many of your managers/employees were trained by them?
- 1) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 2) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 3) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_
- 4) d) visits: \_\_/\_\_ and their empl.: \_\_\_\_ e) your empl.: \_\_\_\_ and trained: \_\_/\_\_

## V. Other Sources of Knowledge:

1. Do you co-operate with Japanese supplier(s) producing similar products?

☐ No ☐ Yes If yes, what is a) their name, b) the form of co-operation, and  
c) in which year did the co-operation start?

1) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_

2) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_

3) a) name: \_\_\_\_\_ b) form: \_\_\_\_\_ c) year 19 \_\_

2. Since establishment how many of the management/employees d) of the partner worked at your company on a long-term basis or for projects and e) of your company worked at the partner's company or were trained by the partner?

1) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_

2) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_

3) d) long-term: \_\_/\_\_ or projects: \_\_/\_\_ e) worked: \_\_/\_\_ or trained: \_\_/\_\_

3. Is your company supplied by Japanese suppliers?

☐ No ☐ Yes If yes, a) what is their name, b) in what year did the relationship begin, and c) is there intensive personal contact?

1) a) name: \_\_\_\_\_ b) year: 19 \_\_ c) 

not at all	partially	very much		
①	②	③	④	⑤

2) a) name: \_\_\_\_\_ b) year: 19 \_\_ c) 

①	②	③	④	⑤
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3) a) name: \_\_\_\_\_ b) year: 19 \_\_ c) 

①	②	③	④	⑤
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4. Is your company a member of a supplier association/club? (e.g. SMMT, etc.)

☐ No ☐ Yes If yes, what is a) their name and b) which was your entry year?

1) a) name: \_\_\_\_\_ b) year 19 \_\_

2) a) name: \_\_\_\_\_ b) year 19 \_\_

3) a) name: \_\_\_\_\_ b) year 19 \_\_

5. What is the c) the organiser's name and d) do you have Japanese members?

1) c) name: \_\_\_\_\_ g) ☐ No ☐ Yes If yes, how many? \_\_\_\_

2) d) name: \_\_\_\_\_ g) ☐ No ☐ Yes If yes, how many? \_\_\_\_

3) d) name: \_\_\_\_\_ g) ☐ No ☐ Yes If yes, how many? \_\_\_\_

6. Does your company have its own supplier association? ☐ No ☐ Yes

7. Does your company have its own supplier improvement employees? ☐ No ☐ Yes

8. Does your company employ consultants for training and education?

☐ No ☐ Yes If yes, is it on a regular basis? 

not at all	partially	very much		
①	②	③	④	⑤

9. What other means of education and training does your company use?

(e.g.: seminars, conferences, literature, videos, interactive laser discs, etc.)

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Thank you very much for your time spent. You will receive your customised analysis in due course.

## EXPLORATORY INTERVIEW GUIDELINE (GENERAL EXAMPLE)

[Name of company] ([telephone number])

Treated confidentially! - Tape record? - How much time?

Short introduction!

- Could you tell me something about your daily work?
- When was your company founded?
- What is the structure of your company? And what about the ownership?
- What is your task in this company?
- Did major changes happen since 1980? What were the initiating factors?
- What and how did your company learn from . . .
  - a) customers/suppliers in Great Britain (nationality)?
  - b) customers/suppliers in America (nationality)?
  - c) customers/suppliers in Japan (nationality)?
- Which customer played an important role in your company's learning?
- What other sources were there for your company to learn from Japan?
- Awards? How?
- Is your company in a supplier association? Have you your own one?
- What kind of training does your company provide for
  - a) own management (formal/informal learning)?
  - b) own shopfloor workers (formal/informal learning)?
  - c) suppliers (formal/informal learning)?
  - d) whom else?
- Have you got a company suggestion scheme? Suggestions per employee?
- Does your company reward learning of employees?
- Do you use team/groups as a work structure? What is a team for you?
- What role does standardization play in your company?
- Does your company experiment a lot?
- What role does communication play in your company?
- Company newspaper or letter? Copy?



## IN-DEPTH INTERVIEW GUIDELINE (GENERAL EXAMPLE)





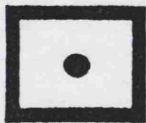
[Name of company] ([telephone number])

[information about Continuous Team Improvement System and/or Employee Suggestion System, the score of the Learning Organization's Characteristics]

Interview will be treated confidentially! - Tape record? - Short introduction.

- Could you tell me something about your daily work?
- You have (have not) introduced an a) Continuous Team Improvement System and/or b) Employee Suggestion System in 19XX. Why?
  - If yes for a), why do you have a full-time/part time co-ordinator for the Continuous Team Improvement System?
  - If yes for b), why only X% of the suggestions implemented in Employee Suggestion System in 19XX?
- What is your experiences with the
  - a) Employee Suggestion System?
  - b) Continuous Team Improvement System?
- What is your opinion about
  - a) Employee Suggestion Systems?
  - b) Continuous Team Improvement Systems?
- How do you spread newly gained knowledge and insights through
  - a) the departments?
  - b) units of your company?
  - c) affiliated companies?
- What is your experiences with and your opinion about
  - mixed project teams? Since when? Why?
  - information and communication? Way versus content?
  - corporate culture?
- Do you know why you won a [name of car company]'s supplier award?
- What were the activities of your customer's improvement people?
  - Any training?
  - Any systems installed?
- Reasons for change in 19XX were indicated with '...'.
  - What kind of change was it?
- Do you have Japanese affiliated companies in your group?
  - Do you benchmark your company with them?
  - Do you have regular contact with them?
- If time available: questions about marked characteristics in questionnaire.

## SKILL DEFINITONS

					
<b>STANDARD OPERATION</b>	CAN DO WITH REFERENCE TO STANDARD OPERATION SHEET	CAN DO WITHOUT REFERENCE TO STANDARD OPERATION SHEET	COMPLETES THE STANDARD OPERATION IN CONTROLLED MANNER AND TO REQUIRED SAFETY LEVEL	CAN TRAIN OTHERS IN THE STANDARD OPERATION	CAN IMPROVE THE STANDARD OPERATION
<b>SPECIFICATION</b>	CAN BUILD OK SPECIFICATION ONLY WITH REFERENCE TO SPECIFICATION DATA	CAN BUILD OK SPECIFICATION WITH OCCASIONAL REFERENCE TO SPECIFICATION DATA	CAN BUILD OK SPECIFICATION WITHOUT REFERENCE TO SPECIFICATION DATA	CAN TRAIN OTHERS IN SPECIFICATION	CAN IDENTIFY RELATED SPECIFICATION ERRORS
<b>QUALITY</b>	UNDERSTANDS THE QUALITY STANDARD REQUIRED	CAN ACHIEVE QUALITY STANDARD REQUIRED	CAN ACHIEVE QUALITY STANDARD AND UNDERSTANDS ACCEPTABLE DEVIATIONS	CAN TRAIN OTHERS IN QUALITY STANDARD	CAN TAKE CORRECTIVE QUALITY ACTIONS
<b>SPEED</b>	CAN COMPLETE STANDARD OPERATION IN 3 X STANDARD TIME OR QUICKER	CAN COMPLETE STANDARD OPERATION IN 1.3 X STANDARD TIME OR QUICKER	CAN COMPLETE STANDARD OPERATION IN STANDARD TIME	CAN TRAIN OTHERS IN STANDARD TIME ACHIEVEMENT	CAN COMPLETE OPERATION IN 0.9 X STANDARD TIME OR QUICKER

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